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PRINTED ON SMITH & MC LAURIN'S CELEBRATED CHROMO PAPER.  
Works Johnstone, Scotland.

FRONTISPIECE TO Vol. 2.



"EVENING"

PRINTED WITH MESSRS MANDER BROTHERS' LITHOGRAPHIC INKS.  
Works, Wolverhampton.



PRINTED ON SMITH & MC LAURIN'S CELEBRATED COLOURED PAPER  
Works, Johnstone Scotland.

Vol. 2

1892-3.



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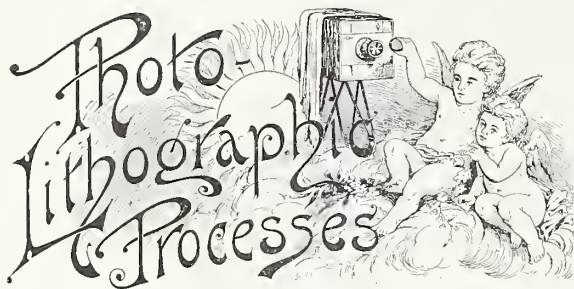
The present number, though a good one, is not quite all we intended it to be, another chromo supplement having failed to put in an appearance.

The next issue will contain the first of our own chromo supplements, and after that we hope to present lithographed supplements continually, with occasional collotype and copper-plate specimens.

To ensure regular supply delivered in good condition, orders should be given through our agents.

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## CHAPTER VIII.

## COLLOTYPE PRINTING.

**C**OLLOTYPE printing, as we see it to-day, is not by any means a recent or spontaneous discovery. Like photography, it had its beginning, and curiously enough its foundation was discovered as early, if not earlier, than photography, giving permanent prints. In the *New Philosophical Journal* of 1839, Mungo Ponton described the interactions of chromic acid and potassium chromate, in which he demonstrated that these two bodies are, if pure, unaffected by light, but when brought into contact with any albuminous compound, such as wood fibre, paper, gelatine, etc., they unite and decompose. That discovery is, of course, both the basis of collotype and photo-lithography, and to the latter must we look for several succeeding steps in this wonderful process of collotype. It was in 1852 that Fox Talbot discovered that a mixture of glue and potassium bichromate, after exposure to light, became insoluble in cold water; and Becquerel observed that the sensitiveness to light increased proportionally as larger quantities of the organic substances, such as starch, paste, glue, sugar, or gum, were added. Fox Talbot's discovery led him to work upon metal plates with this sensitive solution of potassium bichromate and gelatine. On these plates he printed photographs upon the film, then washed out the photograph and etched the picture into the plate. In 1854, Paul Pretsch used a similar method of obtaining a picture upon the gelatine film upon metal, but whereas Fox Talbot bit his picture in, Paul Pretsch put his plate into an electric bath and built up his picture by depositing copper on the washed-out picture. Thus he obtained a picture in relief, but it was not a great success, for in washing out the picture details were lost, whilst in the electric bath the gelatine was apt to swell and spoil the lines, and finally the half-tones were anything but perfect. The success of plates prepared by these two methods may be judged from two excellent examples in Dr. H. Vogel's "Chemistry of Light and Photography."

The next step towards the goal of collotype was really in Poitevin's discovery that a fatty ink would adhere to the hardened or oxydised mixture of gelatine and potassium bichromate after exposure to light.

But Poitevin applied his discovery in the direction of photo-lithography upon paper, which was really the embryo of collotype. He did not altogether overlook the importance of his discovery, and actually prepared a species of collotype print from it. The idea grew, but at first in an apparently wrong direction. We find that Tessié de Motay and Maréchal of Metz continued the researches of Poitevin by putting the film upon metal plates. By this means prints of a moderate kind were obtained, but the difficulty of keeping the film upon the plate could not at first be overcome. Following on these experimentalists, Joseph Albert, of Munich, introduced glass plates as the foundation for the bichromated gelatine film, and thus was able to expose the back of the film and harden it to the glass more firmly. He printed from these glass plates between indiarubber-covered rollers, and his prints became well known as Albertypes or lichtdruck prints. His prints went beyond the stage of mere experiments, for it is found that he published collotype prints of "Schwind's Fairy Tale of the Seven Ravens" and cartoons of Kaulbach, as some of his earlier works. Coming down to within the last twenty-five years, Obernetter, of Munich, is found contributing excellent examples of collotype. His views of the Vienna Exhibition were at the time frequently mistaken for photographs, and he successfully produced collotype prints from the photographs taken by the Prussian army during the German campaign. Since then, the more extended researches of Albert, Obernetter, and Husnik have solved many difficult problems and have made collotype so straightforward that the beginner can with confidence embark in the practice of one of the finest photo-mechanical printing methods without the possibility of failure attending his earnest efforts.

## CHAPTER IX.

## MATERIALS USED IN THE FILM.

So much depends upon a thorough knowledge of the characteristics of the materials used in collotype printing, that it is considered preferable to enter closely into the details of the substances used before actually describing the method of mixing or using them. In many mechanical operations—such, for instance, as dry-plate photography—it is of secondary importance to know the minute chemical qualities of any of the materials used, whilst it is all-important to know how to use the chemicals when prepared. But in the preparation of the collotype film it is all important to know in every respect how each ingredient will act, and such a knowledge can only be obtained by starting with the clearest understanding of the materials used.

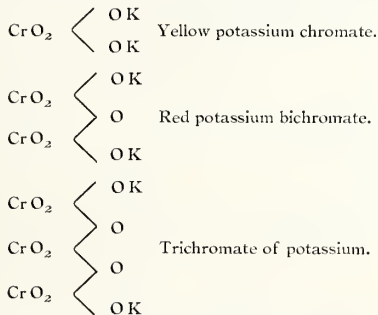
To the reader of the foregoing chapters on photo-lithography, it will have become quite apparent that the basis of collotype is the preparation of a film which will adhere to a support and, under the action of light, will oxidise or harden, and in so changing become susceptible of receiving printing ink from which impressions can be printed. Such, in brief, is the plan of collotype printing, and in the main the film used has a marked resemblance to the composition on a photo-litho transfer paper.

This latter composition depends for its activity under light to the presence of a gelatinous or other organic substance, which will harden or oxidise by the action of light, and having its oxidising property increased by the addition of a mineral salt which will readily give up a quantity of its oxygen under similar circumstances.

The salt principally used is potassium bichromate, whilst the organic material is a form of gelatine.

#### I.—POTASSIUM BICHROMATE AND ITS ALLIES.

In Sweden, in America, and in the Shetland Islands, is found a black neutral chrome-ore, which when fused with potassium carbonate and chalk produces a melted mass, from which, by treating with water, the yellow chromate of potassium ( $K_2CrO_4$ ) is formed. From this chromate the other chromic compounds are produced. Thus, by treating it with sulphuric acid ( $H_2SO_4$ ) the bichromate of potassium ( $K_2Cr_2O_7$ ) is the resultant compound. To illustrate the character of these compounds graphically, they are best shewn by the following extended symbols, in which Cr. represents chromium, O oxygen, and K potassium :—



Such a tabulation exhibits more minutely the amount of oxygen in the constitution of these salts.

The bichromate, when boiled with sulphuric acid and alcohol, is reduced or loses its oxygen and becomes converted into chrome alum, which is a double salt of potassium sulphate ( $K_2SO_4$ ) with chromium sulphate [ $Cr_2(SO_4)_3$ ] and 24 molecules of water ( $H_2O$ ).

If, in reducing the natural ore of chromium, a sodium carbonate or ammonium carbonate had been used in place of the potassium carbonate, then the whole series of salts would have become sodium bichromate, etc., or ammonium bichromate, etc., in place of the potassium compounds. These latter salts, especially the sodium ones, have been found so useful in photo printing processes that the reader should not overlook the economy of their use wherever permissible. As a rule, potassium bichromate forms a saturated solution in ten times its weight of water at  $16^\circ C$  ( $60.8^\circ F$ ), but will dissolve in a smaller quantity of hot water.

To form some idea of the ready manner in which these chromic compounds give up their oxygen, it can be illustrated by dropping alcohol on chromic acid, and immediately the exchange of oxygen causes the spirit to burn.

When chromic acid or bichromate of potassium is brought into contact with almost any organic substance, an oxidising action sets up and hardens the

tissue, forming a mass insoluble in cold water and of such a nature as to take up printing ink. It is a hardening action not unlike this which results in tanning operations. The alum used in tanning precipitates a hardened compound of the gelatine, thus giving tanned leather its hardness.

The potassium bichromate used must be as pure as possible, and must be most carefully filtered before being used in the preparation of films for collotype.

Potassium bichromate in solution, if not in the presence of sufficient liquid, will recrystallize, and this particular property is often the cause of serious damage in films containing it. Sodium bichromate is so readily soluble as never to cause this trouble. It is this characteristic of potassium bichromate which governs the amount of it that is to be used with gelatine, and although many gelatine films cannot contain more than one-fifth by weight (when both are dry) of the potassium salt, yet some can take up one and a half to twice that amount without the crystallization occurring.

At this point it is advisable to examine the claims of the bichromates of ammonium and sodium. One point which has just been alluded to is solubility, and upon that relies the chance of the salt crystallizing out whilst in the film of the collotype plate. Too much stress cannot be given to attention in this matter, for it may ruin a film and lose time in reparation.

The following tabulation shews experimentally what has been determined on this point :—


1½ ounces of potassium bichromate will dissolve thoroughly	in 20 ounces of water.
5 ounces of ammonium bichromate will dissolve thoroughly	in 20 ounces of water.
15 ounces of sodium bichromate will dissolve thoroughly	in 20 ounces of water.

These figures are the result of practice and may be accepted as a good guide, although it is more frequently given that potassium bichromate requires ten times and sodium bichromate twice its weight of water to make a saturated solution. Thus sodium bichromate is the most soluble and will not under any circumstances lead to crystallization in the film, however much may have been accidentally introduced. On the question of quality it can be readily demonstrated that the sodium salt leaves nothing to be required. Thus the potassium bichromate is represented by the formula  $K_2CrO_4$ , the sodium bichromate by  $Na_2CrO_4$ , and the ammonium bichromate by  $(NH_4)_2CrO_4$ . In each the radical  $CrO_4$  is of the same weight, whilst the bases are of different weights. The  $K_2$  represents by weight 78.08; the  $Na_2$  represents 45.98 and the ammonium represents 36.02. The whole salts  $K_2CrO_4$  weigh 78.08 + 116.24;  $Na_2CrO_4$ , 45.98 + 116.24; and  $(NH_4)_2CrO_4$ , 36.02 + 116.24: shewing that the ammonia salt is lighter than the sodium and the sodium lighter than the potassium. Such examination proves the far greater economy of the sodium or ammonium salt, for whilst it is necessary to purchase 194.32 ounces of potassium bichromate to get 116.24 ounces of the radical  $CrO_4$ , it is only requisite to obtain 162.22 ounces of the sodium bichromate or 152.26 ounces of the ammonium salts to procure exactly the same working power in the radical



$\text{CrO}_4$ . These differences in weight mean a considerable difference in cost. The difference alone between the sodium and potassium salts, as shewn in the weights above, is 32.1 ounces, or rather more than 2-lbs., which, at 1/- per lb., means a loss of 2/-, whilst on the whole bulk as shewn above, the cost of the potassium salt at 1/- per lb. would be 12/1½, and the sodium salt at 6d. per lb., 5/1. Although the ammonium bichromate is lighter and presents some of the advantages of the sodium salt, yet it cannot be overlooked that too much of the ammonia salt in a film will crystallize in concentric rings, and if, in drying, the heat should exceed 50° or 60°C, the ammonia is driven off, the film will have a pale brown appearance and will lose much of its sensibility and solubility. As will be seen in subsequent matter, the ammonia salt has other interactions which do not altogether commend its use.

### Screens for Photo-Zincography.

 POSSESSION of a good screen is quite half the battle in producing a good half-tone zinc block, and, unfortunately, it is very difficult to obtain. The old methods of using wire gauze or a paper print from a ruled copper or steel plate are, to all intents and purposes, obsolete—the first on account of the impossibility to obtain a piece of gauze at all perfect, and although the imperfections were not so prominent in the original, in the zinc block they were startlingly so; the second method because it is difficult to get a print sufficiently black to give the requisite clearness to the lines. The latest improvements are two—first, to rule the lines upon a glass plate, and fill them up with opaque pigment, and use the plate as a screen, or to use the ruled plate as a matrix, and by photographic means make screens from it. Another plan is to coat a glass plate with an opaque film, have this ruled one way only and then photographed. These screens are necessarily expensive—first, because of the difficulty in getting a plate of any size ruled absolutely perfect, and unless it is perfect it is of no use; secondly, when the ruled plate is obtained, the making of perfect copies is a work of great difficulty. The collodion process alone can be employed, and anyone who has worked at it knows the difficulty in getting negatives free from blemish.

Here is the simplest method to get good screens:—Procure a sheet of best patent plate, one-eighth thick, 18×24-in., absolutely free from the slightest scratch or imperfection, clean this thoroughly, albumenise it; when dry coat with a very powdery collodion (iodised), sensitise, drain, expose to the light, flood with iron developer and let this act till the film is black; wash thoroughly, then immerse in the cyanide solution, wash again, then bleach in solution of nitrate of lead and of ferricyanide of potash or of bichloride of mercury; wash thoroughly, then blacken with sulphide of ammonia; wash and dry.

Now, if the collodion used is not of a horny nature, such a film will bear ruling with one hundred lines to the inch without the slightest trace of tearing or

dragging, and when so ruled with diagonal lines (not crossed) can be used to make good screens up to 15×12-in. as fine as will be useful. Such a ruled plate is erected in a dark room window, a sheet of clean ground glass outside it about six inches away, and a white reflector at an angle of 45° fixed outside the ground glass; inside the room a good substantial camera, fitted with a first-class lens, must be put exactly parallel with the ruled plate; the lens cannot be used up to its full covering capacity, as it is required to give absolute sharpness up to the corners; for such screens, 12×10-in., a lens of twenty inches focus is necessary. A fine focussing glass must be used in adjusting the focus.


The negatives are made upon patent plate, the process used being dry collodion. To get the crossed lined screen two such negatives are made, and when finished and dried are cemented together with Canada balsam, the two films being inward; this gives a screen sealed against any accident except breakage, and the two glass plates have no detrimental effect upon the result.

In America these screens can be purchased ready for use.—*Photographic Times*.



### "Plant Form" Supplement, No. 6.

#### FUCHSIA.

 HE Fuchsia belongs to the natural order *Onagraceæ*, and includes a large number of species, natives of South America and the southern parts of North America. To speak botanically, the plants partake of the nature of shrubs, being found as plants, sometimes as climbers, shrubs, and small trees, with pendulous red flowers, the calyx of which is funnel-shaped, four-cleft, finely coloured; corolla four-petalled; fruit is a four-celled berry; leaves are opposite; flower stalks one-flowered, springing from the axils of the leaves, or sometimes forming racemes at the tops of the branches. Some of the species are much cultivated in gardens and hothouses, and all may be propagated by cuttings. Most varieties of the fuchsia are too delicate to rear out of doors in the northern parts of Great Britain, but in the milder districts few flowering shrubs are so popular. Many new varieties and hybrids have been produced, and whether in window-box, flower-bed, or hedge, almost any of the fuchsia growths may be made to look extremely ornamental. In some species the wood is used for dyeing black, and some varieties of South America produce a berry which is eaten by the natives. The general appearance of the plant is extremely rich and handsome, and easily lends itself as a subject for decorative purposes.

The *Art Journal* frontispiece for August is a fine photogravure from the picture by Feyen Perrin, of "The Return of the Oyster Fishers at Cancale"; and the September number contains an original etching by Percy Robertson, which has very good effect and touch about it.



FUCHSIA ARABELLA  
Common White



Plant Form.  
No. 6.





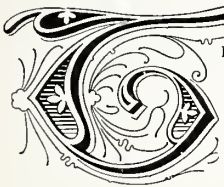
BY CHARLES HARRAP.

## CHAPTER III.—Continued.

## SUBSTITUTES FOR LITHOGRAPHIC STONE.

## VI.—SALCHER &amp; SCHWERTZCHLAG'S PATENT PLATE.

No. 17,162, 1887.



THIS patent represents one of the simplest attempts to produce a layer of carbonate of lime upon a zinc plate with the properties of lithographic stone. To prepare a zinc plate, it is first etched in a three per cent.

solution of nitric acid ( $\text{HNO}_3$ ) in water; after the face of the zinc is thus lightly grained it is washed and dried. Upon this grained surface a layer of slaked lime is coated; and the plate left to dry in a well-ventilated room, where the air can act upon the lime and cause a film of carbonate of lime to enter into a very close adherence with the zinc. The dried lime may then be brushed off, and if necessary a second coating put on so that the film may be thickened. The coating having been made of sufficient depth, the loose lime is well brushed off, and the whole film well washed over with a strong solution of alum. From this source a quantity of alumina, either free or in combination with sulphuric acid (which will probably combine again with the lime upon the face of the plate to form gypsum or plaster of Paris), becomes incorporated with the limy coating. It has already been pointed out in section V. of this chapter, that alumina is probably one of the nearest metals to approach lithographic stone in its qualities, and it is in its use on this plate that the property of the coating is so materially strengthened. Plates thus prepared simply require a good rinse in water before using them to transfer or draw upon.

In all cases, after a transfer is put on a plate, it is etched with a compound containing:—

Liquid gum	...	...	...	100	parts.
Water	...	...	...	150	„
Nitric acid ( $\text{HNO}_3$ )	...	...	...	20	„

After this etching solution has dried it is washed off, the work is rolled up, and finally a less severe etching solution is used to keep the work clear. This latter contains only:—

Liquid gum	...	...	...	100	parts.
Phosphoric acid	...	...	...	10	„

The plate is allowed to dry with this on, and afterwards is treated exactly as stone. If, however, any corrections are to be made, the old work is removed as advised in section II. of this chapter for metallographic plates (now known as zincolith plates), and the abraded surface is treated with a solution of:—

Water	...	...	...	2,000	parts.
Alum	...	...	...	20	„
Acetic acid	...	...	...	5	„

This is allowed to dry on; then washed off with water, and the solution relaid upon the plate. This second time it is allowed to remain, and the corrections made upon it. Finally the new work is etched with the gum and phosphoric acid solution before proceeding to gum up and print.

## VII.—WEZEL &amp; NAUMANN'S PATENT PLATE.

December 9th, 1885. No. 3,305.

The foregoing patent is so closely allied to this one that it seems the best plan to deal with them in direct succession.

In this patent, instead of simply using the carbonate of lime and alum as just described, a closer kinship with lithographic stone was established by crushing up lithographic stone, chalk, marble, limestone, etc., and making a solution of them in sulphuric acid ( $\text{H}_2\text{SO}_4$ ) and hydrochloric acid ( $\text{HCl}$ ). To this solution is added a resinous soap, or a good oil soap, which will precipitate resinous or fatty acids. After this precipitation has gone on some time, the liquid is filtered off; in so doing, any superfluous acid in the solution which has not united with the solid materials, will be taken out. The residue is a moist, limy mass, and its adhesiveness may now be increased by mixing with it a small quantity of asphalt dissolved in turpentine. This moist mass is allowed to dry. The mixture should contain calcium sulphate (as in Salcher and Schwertzhlag's finished plate) with a combination of either lime and resinous acid or lime and fatty acid, as well as the asphalt. The dried powder is next mixed up in a dilute solution of carbonate of soda, and whilst yet in a state of agitation is sprayed by power, such as a steam injector, upon hot zinc plates. The heat of the plates assists the asphalt to dissolve and causes the limy layer to become adherent.

The characteristics of both this patent and the one described in the previous section (VI.) are so exceedingly similar to the patent described as the metallographic or zincolith plate in section II. of this chapter, that it seems highly probable that they are almost identical. The treatment accorded to these plates is exactly the same, and the fluid A seems to be neither more nor less than a mixture of  $2\frac{1}{2}$ -oz. of strongest caustic soda dissolved in one pint of distilled water, whilst fluid B is somewhat similar to the mixture of:—Water 2,000 parts, alum 20 parts, and acetic acid 5 parts, which has just been described.

One thing is certain as regards all the plates described under sections II., III., VI., and VII., that the nature of the coating is not such as to resist any lengthy runs on the machine, nor can they withstand any severity in etching.

The patentees of the plate now under consideration, carried their protection still further by patent



No. 6,353, in 1885, in which they fully described the sprinkling machine used for preparing the plates.

#### VIII.—MÖLLER'S PATENT.

June 7th, 1883. No. 2,836.

Having already in section III. dealt with the characteristics and treatment of the "litho plate," it is interesting to note the nature of the earliest coated zinc plate which reached any success in the market. Möller's patent plate may be considered the embryo from which all recent plates have sprung, and from its success a greater amount of confidence has been established in prepared zinc.

Möller simply coated zinc with carbonate of lime, which was prepared by putting slaked lime into a tank of water, until there was an excess of lime lying in the tank. Through a pipe ordinary carbon dioxide ( $\text{CO}_2$ —carbonic acid gas) was introduced in the lime and water tank, and by its direct action on the lime a carbonate of lime was formed, and became dissolved in the water. The carbon dioxide was allowed to enter until the water became slightly acid, shewing that the water was saturated with the carbonate of lime and was becoming contaminated with the acid gas. The solution was then drawn off, leaving the unappropriated lime in the tank. The solution of carbonate of lime was then sprayed upon zinc plate. The plate was then warmed and allowed to cool, when a second spray was driven on to it. The plate was again warmed, and when cool if the layer was not thick enough the spraying was repeated. The plates thus prepared were ready for use.

But this simple patent did not quite realise expectations. In November of 1884, Mr. C. E. Layton took out a further patent (No. 14,967) as an improvement upon this one by Peter Corfitz Möller. This latter patent by Mr. Layton is the one which is treated upon under section III. of this chapter, and the improvement really consists in an alteration of the carbonate of lime solution. The new coating composition consisted of:—

Quantities used for the two coatings.

	1st coating.	2nd coating.
Bicarbonate of lime ...	200 parts	200 parts.
Alkaline solution of silicate		
of potash ... ..	3 "	12 "
Bicarbonate of magnesia	2 "	6 "
Aqueous mixture of hydrate		
of alumina ... ..	3 "	14 "

The zinc plates were grained by a sandblast, or by graining with emery, etc., and upon this grained surface the above "1st coating" composition was sprayed until the coat was of sufficient thickness. The total amount of material used is noted, and one-sixth of that amount is then taken, having a composition as shewn for the "2nd coating." This smaller amount is sprayed upon the zinc and dried as before.

In the intervals of drying, the surface is lightly brushed to remove any dust which may not adhere. Finally, to bind the whole surface well together and put a slight finish upon it, the surface may be treated with a very small quantity of the alkaline silicate of potash solution. The plate, when dry, is ready for use, as already described in section III.

The patentee, however, gives a few further remarks as a guide in the preparation of the coating composition, and states that the silicate of potash ( $\text{K}_4\text{SiO}_4$ ) solution should yield half per cent. of silica ( $\text{SiO}_2$ ); the magnesia solution should be the bicarbonate ( $\text{MgCO}_3$ ), containing a quarter per cent. of the carbonate of magnesia; and that the alumina hydrate should be the aqueous mixture of precipitated hydrate of alumina [ $\text{Al}_2(\text{OH})_6$ ] containing  $1\frac{3}{4}$  per cent. of the hydrate of alumina.

The foregoing mode of making plates produced a very fair substitute for stone, the hardness of the coating being varied by introducing different proportions of the chemicals. The momentary success which attended their introduction has been the means of bringing out the patents in 1885 by Josz (No. 4,816); by Wezel (Nos. 3,305 and 6,353) in 1887, already described; by Schoembs (No. 10,130); by Salcher and Schwertzhlag (No. 17,162), already described; and, probably, in 1889 by Brocklehurst (No. 12,130); in 1890 by O. Kindermann (No. 7,597), already described. Of these later attempts, some are coated zinc, whilst others are simply grained zinc specially prepared. Of the coated plates, the last to be described is Brocklehurst's patent.

#### IX.—BROCKLEHURST'S PATENT.

1889. No. 12,130.

This patent is at once both simple and easy of preparation, and has had sufficient work done from it to testify to its efficacy. The zinc plates are grained by cleansing them in dilute sulphuric acid. The grain given is very slight, but sufficient to give a bite for the composition, which consists of:—

Sugar of lead ...	2 teaspoonsful	(about 1-oz.)
Nitric acid ... ..	2 "	(about $\frac{1}{4}$ -oz.)
Water ... ..	about half-a-pint.	

The plate is dipped into a bath of this solution, and turns almost black; but by well washing under a tap of running cold water, it returns to a leaden grey. Finally the plate is washed over with dilute acetic acid, and when dry is ready for use, being treated in much the same way as stone combined with the ordinary treatment for unprepared zinc.

#### PATENT AND OTHER MODES OF PREPARING ZINC.

##### X.—JOSZ'S PATENT.

July 3rd, 1885. No. 4,816.

Josz claimed that his treatment was amenable to any metallic surface, which must be chemically cleaned—by a dilute solution of sulphuric, hydrochloric, or nitric acid, or a mixture of the first or last two—then grained. After graining, it should be scoured with any of the alkaline earths except chalk. He preferred a mixture of magnesia and water. The plate should then be dried and the grain opened by spraying on its surface a composition consisting of:—

Water ... ..	100 parts.
Alabaster powder ...	10 "
Alum ... ..	5 "

The plate should be dried with this composition upon it, thus allowing the alum a good opportunity of getting a hold upon the zinc. The composition is afterwards washed off by alcohol (methylated spirit),

the plate is dried and ready for use. In treatment it must be dealt with exactly as unprepared zinc, which will be described in due course.

#### XI.—SCHOEMBS' PATENT.

1887. No. 10,130.

This patent is one which holds probably more in what it claims than its actual capabilities deserve. It seems to be one of those patents which is such an ordinary transaction that it ought not to have been accepted as a patent. The principle of it is simply acidifying and neutralising, and is one of the commonest laws of elementary chemistry taught in our schools. The author has on several occasions given the self-same recipe to operators upon metallic surface and photo-zinc etchers, without for a moment feeling that there was any patent in the idea, and he is of opinion that there is no more patent in it than in producing common table salt from hydrochloric acid and caustic soda. Fortunately there is not any proprietary article about it, and anyone is at liberty to practise it from the following description.

Clean or grained zinc plates are put into a mixture of nitric and sulphuric acids for a brief term, during which the sulphuric acid further granulates the zinc, whilst the nitric acid oxidises the hydrogen generated on the surface by this action of the sulphuric acid. In thus disposing of the hydrogen, the granulating action proceeds in a far more uniform manner. After treatment with two such searching acids the plate must be thoroughly washed with water, and then treated with an alkaline solution to neutralise the acids. The alkaline solution should be one of the ammonium compounds, such as the carbonate or chloride, but on no account should the sulphide be used.

The ammonia has a duplex action, for whilst it is neutralising the acids, it also renders soluble any salts which have formed by exposure of the zinc to the air. By this means, plates chemically cleaned (such as already stipulated as parts of previous patents) are ready for direct use, or for coating purposes.

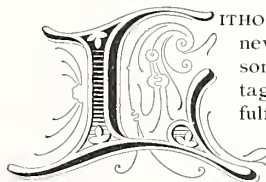
#### XII.—DICKES'S PATENT.

1884. No. 16,884.

This is another patent which, considering the position of zinc etching, zinc printing, and stone etching, seems never to have deserved the name of patent. The method of etching stone into relief for securing good printing throughout a long run is so old that one would not consider it in any way patent. Now, as zinc has been in use for printing for over twenty-five years, the methods applicable to stone were all understood to be equally applicable to zinc. Yet this patent claims the practice of etching the zinc into relief, by using nitric or sulphuric acid, and then treating it with nut-gall decoction, etc., exactly as for printing from unprepared zinc. In another point the patentee claims to etch up the work after having treated it in the usual way for unprepared zinc. Then roll it up well and cover with dilute solution of silicate of potash; thus covering the whites of the picture with a clean material instead of leaving the zinc bare. This may be an improvement in one direction, but it most effectually destroys the future use of the plate.

[To be continued.]

## Lithophile.



LITHOPHILE is the name given to a new French product for which some very considerable advantages are claimed. Whether it fulfils all that is expected of it is a matter of opinion, and depends entirely upon the manner of reading the circular of instructions which accompanies it. In one of the opening paragraphs it is claimed that lithophile "solidifies lithographic transfers," and in another portion of the circular it states that "the grounds are stocked at once, without it being necessary to fill them up with ink." If this be true, then, there must be two ways of reading these sentences. On the face of it, such words would lead anyone to believe that a "bare" transfer would be brought up solid, and that where the solid threading in a copper plate failed to pull a solid ground, that this lithophile would step in and assist "to stock the grounds without it being necessary to fill them up with ink." But we are convinced, after a series of searching experiments, that this is not the case; in fact it would be a serious disadvantage if it were true, for if it tended to fill up in any part of the work it would tend to fill up all over.

Another portion of the circular sets forth the mode of using it, separating the process into five operations, and in comparing it with stone intimates that it suppresses the six ordinary operations in preparing a stone. It is a little misleading, for apparently the use of lithophile includes as many operations as the older method. Thus to use lithophile it is necessary:—

1. After washing off the transfer composition, to carefully gum the stone with a pure gum; not allowing the stone to be left bare by streakiness in the gum. Dry it thoroughly.
2. Wash out the transfer with good turpentine on the top of the dry gum. The turpentine will not disturb the gum.
3. Spread with a clean sponge or rag some lithophile all over the transfer. It is very spirituous, and dries almost at once, and penetrates wherever the gum does not cover the stone.
4. Wash off the gum, and if any bits of lithophile seem to stick, put on gum and rub them away. Even if rubbing does not prove successful, then rolling will.
5. Roll up the work.

After these operations, which are conducted one after the other without much loss of time, the work has a splendidly clear and firm appearance, and it does not matter how roughly the work is used afterwards, it retains this sharpness throughout.

The experiments were conducted with a very closely cut copper-plate memo. heading, containing a quantity of fine cross lines, and it was simply a pleasure to see the fineness of the original so exactly retained in the transfer.

The circular claims that the lithophile adds speed to production, since it assists in making the work clear, and thus more readily preparing it for the

machine. And in support, it says that "a transfer of invoice, which needed not less than four hours by the old system, can now be done in less than half-an-hour by the new process." We can only think that this must be some foreign notion of time, for in this part of the world, on the old system, four invoice transfers are pulled, patched up, and five hundred impressions pulled in less than one and a half hours.

In another paragraph it is claimed that the use of lithophile is something akin to a good etch, for it assists in keeping the work firm for a very long run, and if the work should go bare, it simply needs washing out with turpentine and lithophile to renew it so thoroughly as to allow a second long run to be made. This is a claim we are prepared to substantiate, having seen long runs taken, and the stone at the finish equal in appearance to a new transfer.

It is undoubtedly an excellent compound, and as the quantity used is so small, it will amply repay any firm to put it into the transferrer's and machine-minder's hands to be used in the manner prescribed, or as an effective "doctor."

A point which we were almost overlooking, is that many transfers, even from copper-plate, will not require etching or very little cleaning-up to get them ready to prove, because this lithophile seems to strengthen only legitimate work, whilst the usual plate edge-mark, etc., disappear.

The odour from lithophile is by no means disagreeable, reminding one of a solution of indiarubber or vulcanite in methylated spirit. Such a comparison brings to mind the composition of a very good "doctor," which, in all probability, would have much the same effect as lithophile. Generally the printer is satisfied with a good plate retransfer ink rag as his "doctor"; others rely upon palm oil; others dissolve "chalk" parings and palm oil in turpentine, and obtain a very suitable material; but one which meets even the worst requirements consists of:—

Litho artists' chalk parings	...	...	2-oz.
Bitumen	...	...	2-oz.
Turpentine	...	...	$\frac{1}{2}$ -pint.

With such a "doctor" the printer can bring up all the work to its original strength; and should he be printing in colour, the use of this "doctor" does not require that the work should be washed out either before or after use. The bitumen so hardens the surface that printing can go on at once.

Whilst experimenting with lithophile, one small corner of the work was treated with litho writing ink instead of lithophile, and it was found that the work did not retain its sharpness.

Again, many attempts were made to prove if the lithophile would really assist in solidifying the transfer in its bare parts, and to give it a chance the gum was put on very bare. The result was that the lithophile almost got hold of the stone. To remove it more quickly it was washed off with turpentine after the usual operation, No. 3, as shewn above, and it was with the utmost difficulty that the work was again brought back. Terebine was used and heavy rolling, ultimately bringing it back, and finally leaving the transfers on the stone in a condition which any printer

would be satisfied with, and would not be able to improve, even had it been rolled up and etched in the old way, remembering that during the whole series of lengthy experiments the stone had not been etched once.

## PRINTERS' INK.

**I**F half the ink that's vainly spent  
Had figured in advertisement,  
To tell the world in letters bold  
The kind of wares you bought and sold,  
Or manufactured at your mill,  
The advertiser's purse 'twould fill;  
His credit at the bank would swell,  
His bank book large deposits tell,  
More and more his trade would grow,  
And buyers, too, would always know  
Just where to go to fill the wants  
Of children, cousins, wife, and aunts.  
And keep it up, day in, day out,  
Never falter, never doubt,  
For in the end 'tis sure to tell,  
The people read, if not they spell.  
They'll find out just what you've got,  
But print the truth, deceive them not!  
The press will always give the news,  
While poets, writers, air their views;  
'Twill also tell the world about  
Just where *your* sign is hanging out.  
Then take advice, you'll find it wise,  
Use printer's ink and advertise.

UNCLE ABE B. in *The Enterprise*.

## "Line" Papers for "Process" Work.

**R**EADERS will note with interest the illustration, "Teddington Old Church," in the present number. The result may be easily mistaken for a print from a good half-tone process block, and it may be mentioned that the illustration is a reduction to one-half of the original sketch. For this class of reproduction, Messrs. Gilby & Hermann, 9 and 11 Garrick-street, Covent-garden, W.C., are selling prepared "line" cards which are intended to be used in lieu of the screen plates of the process engraver.

The card is prepared with a chalky surface, readily removed with a knife or other sharp instrument, and the lines are of various degrees of fineness. The lines are printed in jet black on the chalky surface in close parallel lines, and then embossed in indented lines the reverse way—crossed, giving a serrated appearance.

The artist begins by putting in the dark touches of his proposed sketch, by drawing either with black crayon, liquid Indian ink, or lampblack, providing he does not put a flat wash, then scrapes out the high lights clean, taking the printed black line of the ground right out; a half scrape producing the quarter tint. The process is by no means laborious, and is easily mastered by the artist. Our readers are recommended to write Messrs. Gilby & Hermann for particulars as to methods of using these cards, and for prices and other information. The introduction of the prepared cards marks a distinct step in advance in the reproductive arts, and the method deserves to become widely known.





ZINCO BLOCK BY **CARL HENTSCHEL**, 182 & 183 FLEET STREET, LONDON, E.C.

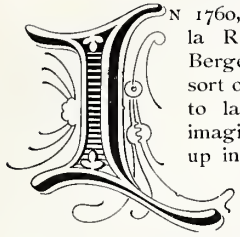
REPRODUCED FROM A DRAWING ON GILBY & HERMANN'S READY-PREPARED LINE CARDS

(See description elsewhere in this issue.)





## The Figaro-Photographe.



**L**N 1760, an odd writer, Tiphaine de la Roche, emulating Cyrano de Bergerac, related in a whimsical sort of book, now extremely difficult to lay hands on, how in certain imaginary adventures he was taken up in a hurricane and transported to the land of the genii, who initiated him into the secrets of nature.

"You know," said one of them, "that rays of light reflected from different bodies are pictured and reflected in many kinds of polished surfaces, as, for instance, on the retina of the eye, on water, and on glass. The spirits have sought to fix these passing figures, and have made a cunning material by means of which a picture is made in the twinkling of an eye. To this they present a piece of cloth, and on it the objects they desire to remain are fixed. The cloth acts first as a mirror, but unlike the glass, which merely retains the image temporarily, the cloth, owing to its sticky nature, retains the picture. The mirror reflects what is before it temporarily, but does not retain the image. Our cloths reflect no less faithfully, but unlike the glass, they retain the subject reflected in them. This impression is the work of an instant. We then take off the cloth and place it in a dark room; an hour later the coating is dry, and we have a valuable picture that no art is able to surpass in faithfulness to the subject."

The writer of these prophetic words would be somewhat astonished if, after the lapse of a century, he returned and saw his dream, not merely realised, but perfected, and become one of the principal branches of the graphic arts. In fact, photography, born as it were yesterday, has, solely by its own merit and its numerous resources, claimed a foremost place in the reproductive arts. When examining the daguerrotype of forty years ago and comparing it with the instantaneous efforts of the present day, we may well be astonished at the progress made in so relatively short a time.

In spite of its rapid growth and its present perfected style, photography in its various branches remains almost unknown to the general public, and it is to popularise this study that the International Exhibition of Photography, opened on the Champs de Mars, was organised. But still, this attempt at popularising the knowledge of the art was confined to a small section of visitors, who, however numerous they may have been, could not be more than a very small portion of the large general public.

The *Figaro* recognised this, and to perfect the work as commenced by the Chamber Syndicate of Photography, the great Parisian journal issued the *Figaro-Photographe*.

M. Leopold Martin-Laya conducts the new publication. With a courage and spirit we must commend, he goes himself to see the photographers, phototypers, heliographers, photo-engravers, and requests them to lend their aid to the work by furnishing

specimens of their productions. He then gives an epitome of what he has found out, with illustrations of every branch shewing the progress made by photography.

To illustrate photogravure in half-tone, or heliogravure, a portrait by George Petit has had interposed between the plate and the pellicle a black surface, which reflects a model of some statuary. The gradations of white and black are very curious, as is the continuity of the velvety tone. The subject is after nature.

Photographic printing on gelatine, or phototypy, is represented by some beautiful proofs.

The brothers Berthaud have solved in their contribution the previously unsolved problem of reproducing, by means of gelatine, a photograph subject instead of a subject after nature. The gelatine requires, in fact, a *direct* impression so as to render in its best form the clearness of a subject in the same manner as the model. Applied to the reproduction of a subject that is itself a reproduction, it risks blurring. After having recommended their plate seventeen times, the brothers Berthaud have at last obtained the first proof on gelatine of the celebrated fresco of Michael Angelo—"The Last Judgment." Messrs. Braun have been good enough to allow the *Figaro* to reproduce this gem which has long defied the efforts of photographers and the expenditure of time and money. This plate is trebly interesting from its execution, the difficulties of the working, and its entirely new style. The same phototypers show an illustration of their process applied to science: these are some reproductions of microbes of a truly remarkable exactness, and which ought to give every satisfaction to scientific men.

Again, among the phototypes should be mentioned the proofs of M. Gervais-Courtellemont, of Algiers. This young artist has sent a specimen of the reproduction of landscapes. His "Entrée du Désert" is a really fine piece of work.

The work of Messrs. Chene & Longuet is an application of gelatine to the reproduction of features. The caricatures reproduced have been obtained from the collections of Messrs. Pierre Veron & Nadar and from the Carnavalet museum, and are interesting as shewing the early stages in the history of the photographic art.

The charming child subject of M. Larger, as shewn in the *Figaro-Photographe*, proves that the instantaneous photo has not had its completeness spoilt by the impression on gelatine.

The firm of Lemercier have two specimens reproduced from stone—a Gavarni and the famous portrait of Léon XIII. in colours.

Photography in relief and half-tone are also shewn. Messrs. Petit & Poirel have an instantaneous enlargement of a portrait, and M. Dujardin some reproductions of sculpture. M. Michelet has furnished a specimen of photogravure in relief taken from some hitherto unpublished subjects in the archives of the National Library.

An interesting application of photography is made by M. Champigneulle, who has obtained some fine church windows by using a photographic basis and afterwards having the colours completed by Lemercier.

For the remainder, numerous photogravures by well-known houses are distributed among the text, including instantaneous photographs of a varied range of subjects, and reproductions of medical, scientific, and astronomical subjects.

The reading matter is no less attractive. A series of condensed articles on the history of photography and the numerous allied arts, along with details of recent inventions, are skilfully dealt with. J. D.

## Waterproof Varnish for Paper.

IN very many cases waterproof varnishes are useful, and among their uses may be mentioned their application to laboratory labels, and their use for the fixing of drawings.

There are many such varnishes, but, according to our own experience, one of the best is a thin solution of gutta percha in benzole, and such a varnish may be made by dissolving one or two parts of fine gutta percha foil in a hundred parts of benzole. The heat of a water bath serves to make the gutta percha dissolve tolerably quickly, but if it is necessary to have the preparation at once, the gutta percha may be dissolved in a little chloroform, and this is then mixed with the required bulk of benzole. Paper which has been coated with varnish can be easily written, drawn, or painted upon; and it must be remembered that the gutta percha varnish does not make the paper transparent or spotted. It is known that gutta percha slowly oxidizes in the air, and becomes converted into a brittle resin; but this oxidation product is itself a waterproofing agent.

Alcoholic solutions of resins tend to make papers more or less transparent, but the following varnish, prepared with acetone, is not subject to this drawback.

One part of dammar is dissolved in six parts of acetone, the materials being allowed to digest together for some weeks; the clear liquor is now decanted off, and mixed with its own volume of plain collodion.

Another method of making a waterproof varnish for paper consists in digesting thirty parts of white shellac with 300 parts of ether and then agitating the solution with fifteen parts of finely powdered white lead; on filtering the solution, it will be found that the white lead has been very effectual in clarifying the solution.

The above resinous varnish gives more lustre than the gutta percha varnish, but the latter gives far more flexibility, a considerable advantage in many cases.

Not only silver prints, but also collotypes, and photo-mechanical impressions, may often be advantageously treated with one of the above varnishes; and it must not be forgotten that anything which protects a silver print against damp serves to diminish the tendency to fading.—*St. Louis and Canadian Photographer.*

THE "WILD WEST."—Mr. Natt Salisbury, "Buffalo Bill's partner," being interviewed, said:—"We keep forty men out posting. In six months we shall have spent from £150,000 to £175,000 in advertising. The bills on the London hoardings just now cost for printing alone £8,000, and we have eighty tons of placards in the stores ready for immediate use." The whole of these placards are "printed abroad."

## Photographing on Wood for Wood Engravers.

By W. J. RAWLINGS.

IN the first place the wood block must be prepared in such a way as to prevent water penetrating into it, and to give it a uniform colour, also to fill up the pores of the wood to prevent staining.

This is effected by sprinkling a small quantity of zinc white, and adding sufficient albumen, spreading with the ball of the hand until the coating is even and smooth, and finally finishing with a camel-hair brush. The above operation requires some practice to perform successfully, and if rightly done will not give any trouble to the engraver, not even for the finest tints. All blocks will not require the same amount of albumen and zinc white, as some are more porous than others. The right proportion can only be obtained by experience.

When perfectly dry, sensitise by coating as you would for a collodion plate, with the following solution:

Alcohol	...	...	...	...	...	5-oz.
Ether	...	...	...	...	...	5-oz.
Pyroxyline	...	...	...	...	...	20-gr.

When the pyroxyline is dissolved, add seventy-five grains silver nitrate dissolved in the smallest possible quantity of water.

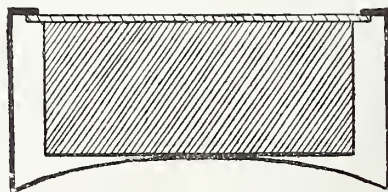
It is best to keep the above solution in the dark room.

This solution gives a slight film, which must be removed from the block before printing. To do this use cotton wool saturated with the following solution:

Ether	...	...	...	...	...	5-oz.
Alcohol	...	...	...	...	...	5-oz.

Dry and coat again with the sensitising solution before quoted, and apply cotton wool saturated as before.

The block is now absolutely left without any film, and is ready for printing under a reversed negative. The most simple and quickest way for fixing the negative and block together for printing is by brass clips made for the purpose (as shown in fig.)



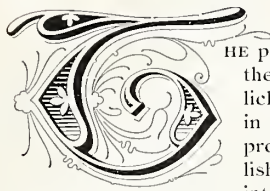
The time required for printing varies according to the intensity of the light and the density of the negative. With a bright day in the summer, with an average negative, ten to thirty minutes will be found sufficient.

The negative is now removed, and the print is fixed for two or three minutes in a strong solution of hyposulphite of soda, the block then being washed at a tap for about half a minute, when it is placed on its edge to dry. Blocks treated by this process can be produced ready for the engraver under the hour.—*Photography Annual.*



## Photography in Natural Colours by the Collotype Process.

[An abstract from a letter by DR. H. W. VOGEL in "Anthony's Bulletin."]



THE principal event of the day is the exhibition of natural colour lichtdruck pictures (collotypes in natural colours) after the process of Vogel, sen., published in 1885, and practically introduced by the chromo-lithographer, Ulrich, and Dr. E. Vogel. The process is under the patronage of Mr. Pachter, who deals extensively in works of art, and who has formed a company for lichtdruck in natural colours. The reports of all the larger journals are very enthusiastic about this, and the same may be said of professionals. Your humble servant being one of the originators in this matter, he will have to let others speak. The *Staats-Anzeiger* (official organ of the Government) says: "Two ways have been pursued to attain a solution for natural colours.

"First.—Direct views by means of photographic films, which are sensitive to all colours and reproduce the action of each colour in the original colour. To these belong the experiments of Seebeek (Goethe's structural colour system, 1810), Becquerel, Niepce de St. Victor, Poitevin, Zenker, Lippman, etc.

"This method has the defect, that the reproduced colour, for physical reasons, does not resemble exactly the natural colour; further, that it admits only the taking of incandescent bodies (spectrum and coloured glasses by electric light), and that every new picture requires the taking of a new negative of the highest problem of photography in view.

"Second.—Views taken by making use of the colour-print principle, multiplication being thus made possible.

"This second way was proposed by Ransonnet in Austria, and Collen in England, 1865; they required the production of three views from the same coloured object through red, yellow, and blue glass. Thus, three negatives were to be produced, in which on one of them only the red, on the others only the blue and yellow rays had acted. These were to be copied upon stone, and the photo lithographic stones so obtained in yellow, blue, and red were to be applied, printing on the same sheet of paper.

"The idea was not practicable because red and yellow sensitive photographic plates were not known.

"Such plates were first invented in 1873, by Dr. H. W. Vogel in Berlin, and Cros, Ducos de Hauron, in France, and, a little time later, Albert, in Munich, took up again the idea by using the plates made colour-sensitive after Vogel's principle. Albert applied the so-called lichtdruck (better, photo-gelatine process) in place of lithography, by which process the photographic negative is copied upon a glass plate covered with light-sensitive chromated gelatine. This will then show a plate, which can be printed from, in black or in colour, as in lithography.

"But in the choice of the printing ink there were some peculiarities. Every ordinary (black) photographic picture, as is well known, is printed upon

paper becoming black by the action of light, from a negative plate, upon which black has not acted. Analogous to this, a negative plate is used in the natural colour lichtdruck process for the production of the copy in yellow, upon which yellow has not acted; for the production of the copy in red, a negative plate upon which red has not acted. In short, the printing inks and the natural colours, which acted upon the corresponding negatives are in direct opposition. Thus the conclusion was arrived at, that the red-sensitive negative plate was to be printed in the complementary colour, green, that for yellow in the complementary colour, blue, etc. This was indeed an approach towards the natural colour, but it was by no means the actual natural colour.

"The deviations were under circumstances of such a kind that the pictures became, artistically, completely valueless. Prof. H. W. Vogel proved in 1885 the reason of this fault to be such that the definition "complementary colours" is variable to a high degree—that one and the same colour can even have many complementary colours, from which the printers might select those which they thought the most suitable.

"H. W. Vogel set aside this arbitrary action by establishing a simple rule. For the production of the above mentioned, three or more colour-sensitive plates (for views behind red, blue, or yellow glass), coloured by certain light-sensitive colouring matters are necessary, which absorb corresponding red, yellow, green, or blue light. Exactly the same colouring matters, or some resembling spectroscopically, have to be taken as printing inks, according to Vogel's rule, to obtain prints resembling nature.

"Mr. Ulrich, the chromo-lithographer, was the first one to prove, practically, the correctness of this principle. He exhibited at the Berlin Amateur Exhibition in 1890 lichtdrucks made that way, and in 1891 at the German Exhibition in London, where he obtained the first prize.

"About the same time Dr. E. Vogel, jun., took up this matter, and obtained results by application of new plate colourations, which he prepared himself; also, by application of new corresponding coloured ray filters in place of the coloured glass plates, which always change in their colouration, which surpassed all previous ones.

"In consequence of this and in consideration of the importance of the matter, the Society for Lichtdruck in Natural Colours took the further development of the process in hand, and appointed Mr. Pachter, of the firm of R. Wagner, as manager. The society, after having reproduced to the satisfaction of the originators the best masterpieces of Mengel, Knaus, Graeb, Auvasovsky, and Breitbach, has now placed its products in the market. The significance of the process is clear. The results of painstaking efforts of the chromo-lithographer, after months of hard labour, by using sometimes twenty or more stones, can be accomplished now by the new process in eight days and with only three plates.

"The process is, of course, not only for lichtdruck (photo-gelatine print), but is also applicable for photo-lithography and photo-zincography (book printing), and by the latter a new era may be introduced for book and newspaper illustrations in natural colours. Oil paintings, which heretofore could be only reproduced in black, will henceforth be offered to the public in natural colours."

The following expresses the opinions of eminent photo-lithographers and heliotypers here, as given in the report of the Society for the Advancement of Photography, May 20th :—

"Herr Gaillard finds the proofs above praise, and is surprised that with the three colours presented, an effect is to be obtained which before was only practicable with the aid of from eighteen to twenty-four plates. Herr Otto Rau, a practical artist, is of the opinion that we have a photographic event of the highest importance before us; failure would be out of the question after such accomplishments, and he congratulates the inventors. He desires to know the average time for these views. Herr Dr. E. Vogel says that for landscapes from nature, with good light and small diaphragm, which require, ordinarily, two seconds, all three views can be made in sixty-two times the time of exposure. A clear time of exposure of about two minutes only was therefore necessary. To this might be added the few moments for changing the plate-holders and ray filters. Herr Gaillard thinks it to be interesting in view of the joyful event to recall the historic development of natural colour printing. He calls attention to the experiments of Joseph Albert, sen., the process of Obernetter, Von Hoesch, and the one applied by Troitzsch, where the work of the artist was oftentimes spoiled, while here photography does everything. These remarks met with general approbation. Herr Rentschmid, artist and chromo-lithographer, cannot suppress his surprise that prints true to the original are shown here, which were made with three, properly only two, colours (the yellow giving no depth), which otherwise could be obtained only with twenty colours. Chromo-lithography has arrived at a turning point. As the present process furnished plates ready for printing in two or three days, while it took the chromo-lithographer four to five months to finish by using about twenty plates, the competition was great, particularly as good and faithful reproductions are to be expected here."

### Animated Images.

TAKE two negatives from the same person, but in two different positions; for example, a woman taking water at a pump; in the first picture the arm will be raised, then lowered in the second, and the two attitudes of the woman will be in relation with the two positions of the arm of the pump. Of these two negatives print two proofs and paste the two images (toned, fixed, &c.) on the two opposite surfaces of the same cardboard; by twisting it between the fingers you will cause the cardboard to revolve rapidly, and you will obtain the sensation of the motion of a person pumping water. This can be applied to any other subject.—*Photo Gazette.*

### Indestructible Photo-Litho Transfers.

IT may be of considerable importance to many printers to know that Mr. J. Mearns, of Manchester, has proved the almost indestructibility of photo-litho transfers. It is the general usage in the trade to put down a photo-litho transfer upon a warm stone, and after pulling off the transfer paper to throw it away as useless, just as with stone to stone or other transfers; but such a practice is unnecessary, and frequently leads to loss of time and money in preparing a second transfer, should the first one have proved a failure. Mr. Mearns had a photo-litho transfer handed to him some months ago, and when transferred he was not at all satisfied with the result. He had not thrown the transfer away, and he next turned his attention to see if he could in any way improve on his first effort. The thought struck him that the virtue still remained in the gelatine film on the paper, and he was not long in putting his thought into practice. He mixed some very good retransfer ink and let it down with a little turpentine, and then mixed some thin gum solution into it. With a sponge he dabbed this mixture on the photo-litho transfer, and was well repaid by seeing the old work come up even better than when the original was placed in his hands. He next laid the transfer on a stone and allowed cold water to run all over it for some time, after which he again transferred it to stone. In this way he transferred it and inked it up four distinct times, the last time yielding a print with which he was thoroughly satisfied. He has since found that artist's writing ink gives even clearer results than retransfer ink. Such a discovery should be of infinite use to printers all over the country, for they may now feel confident in using a photo-litho transfer more as an original. If, for instance, a photo-litho transfer has been sent by post and appears to be bare of ink and smeared, the printer can, with a sponge and good ink as mixed above, ink up the transfer again to his own satisfaction before putting it to stone. Such a course will not entail much possibility of damage if the transfer is thoroughly cleansed with water afterwards, and dried before transferring. The transfer can ultimately be put away and used again as occasion may require.

THE London Society of Lithographic Printers is making great complaint of the continued introduction of cheap German lithographs into this country. They say that the Merchandise Marks Act is entirely inoperative in this matter, as the imprint is placed in such a position that it is hidden in the binding of books. Even if nothing can be said against private firms obtaining lithographs and coloured prints from Germany, surely such bodies as the Religious Tract Society, the Society for the Promotion of Christian Knowledge, and the United Kingdom Band of Hope Union, who are said to be the worst offenders, are scarcely acting fairly to the thousands of British workmen engaged in the lithographic printing trade of Great Britain. The attendance cards of the London School Board are made in France—why? —*Daily Chronicle.*



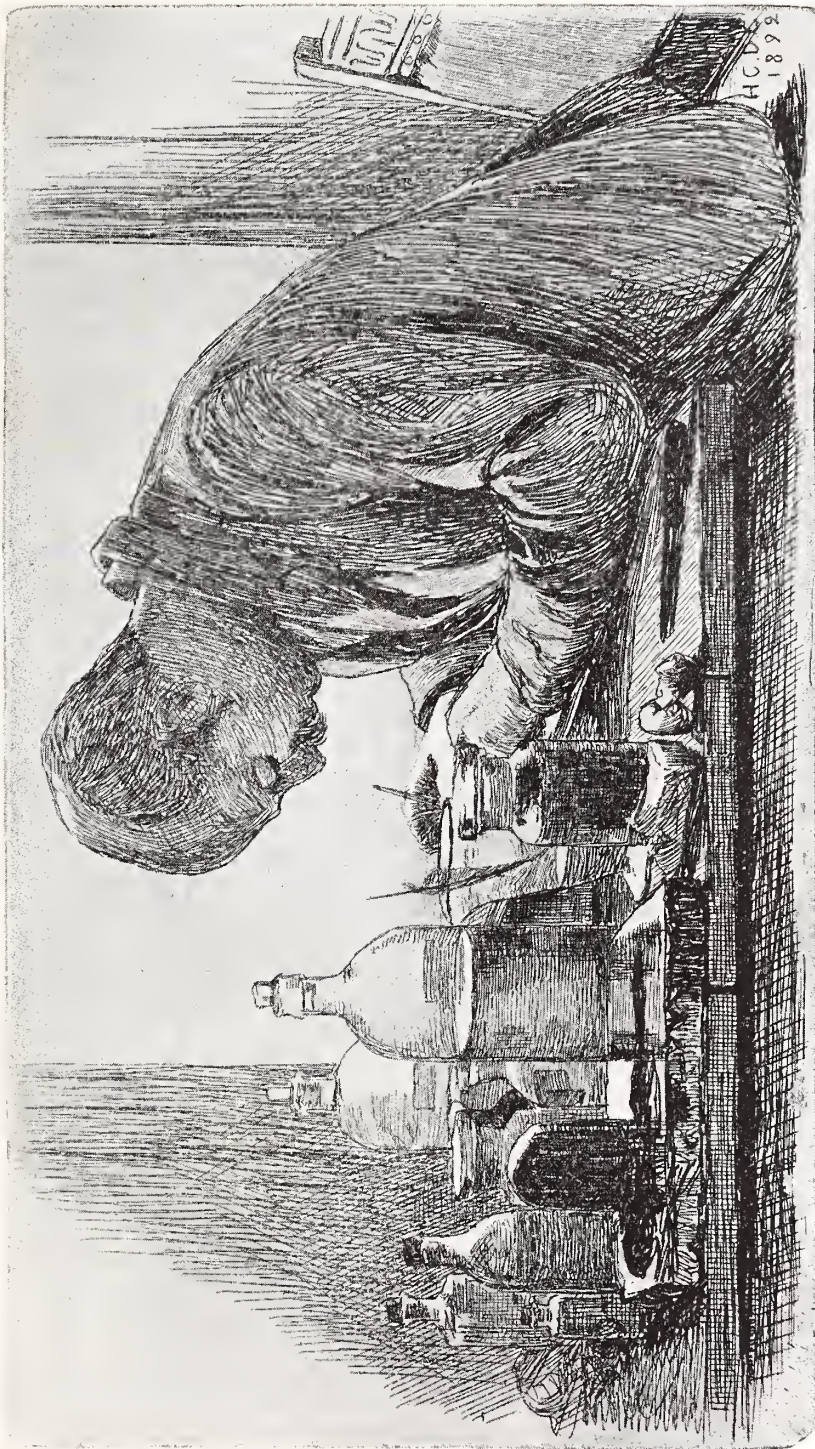
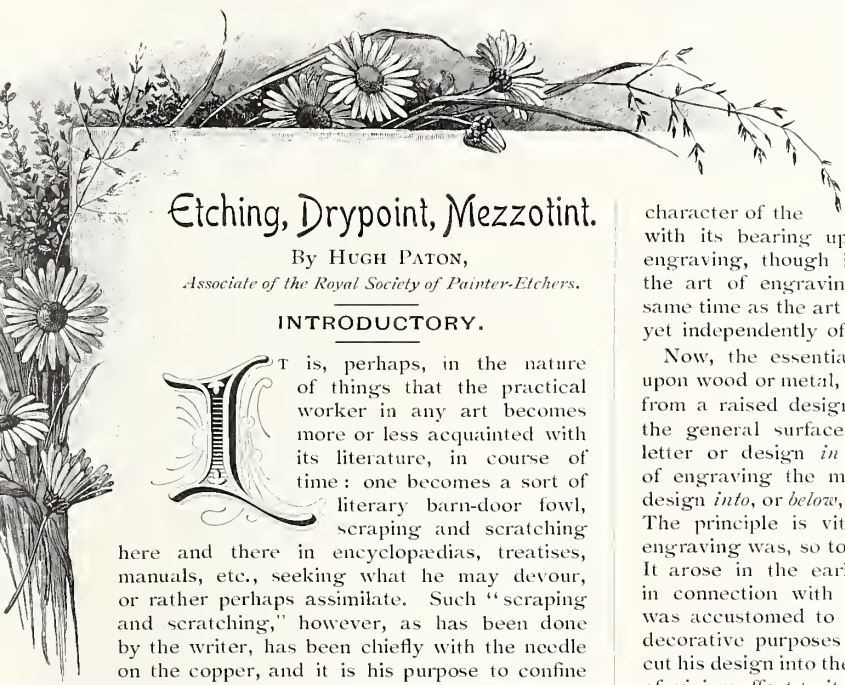


PLATE I.—THE ETCHER AT WORK.

PLATE I.—This is not directly illustrative of the text, as the remaining plates will be, but is *à propos* of the general subject. The etching, from which this plate was reproduced, was specially executed for the author by MR. CHORLTON, of the firm of CHORLTON & KNOWLES, Manchester.







## Etching, Drypoint, Mezzotint.

By HUGH PATON,

*Associate of the Royal Society of Painter-Etchers.*

### INTRODUCTORY.

**L**IT is, perhaps, in the nature of things that the practical worker in any art becomes more or less acquainted with its literature, in course of time: one becomes a sort of literary barn-door fowl, scraping and scratching here and there in encyclopædias, treatises, manuals, etc., seeking what he may devour, or rather perhaps assimilate. Such "scraping and scratching," however, as has been done by the writer, has been chiefly with the needle on the copper, and it is his purpose to confine himself to the description of the practical processes of the three arts: etching, drypoint, mezzotint, and to their results. It will not be necessary, therefore, to trouble the reader with very many remarks from other points of view. It may be advisable, however, to make a few preliminary observations by way of pointing out the essential differences between the various forms of engraving, which word includes the three arts under consideration.

The art of engraving divides itself into four general branches, wood engraving, commonly called wood-cutting; line engraving; etching and drypoint; and, finally, mezzotint. Notice that wood engraving comes first. This is quite in accordance with the evolution of things. Wood-cutting, the art of engraving a design upon wood, is older than the other branches of engraving upon metal. The latter arose more or less simultaneously with the invention of the art of printing in the early part of the fifteenth century. It was about the year 1440 that moveable metal types were first used, and the way paved for printing being set upon an established basis. But this was only the crystallisation of earlier and simpler ideas into a concrete and practical form, and was a development from the older art. As a matter of fact, we have to go a good way further back, and to the far East, for the earliest attempts at cutting designs upon wood. Well authenticated instances of cutting designs in relief can be traced among the Chinese of the sixth century, but it is not until some centuries later, not, indeed, until the close of the thirteenth century, that the art of wood-cutting can be distinctly traced in Europe. During the fourteenth century it appears to have been chiefly employed for the production of playing cards, but upon the introduction of the art of printing it developed rapidly. The printing

of books naturally led to the ornamentation of them with figures cut in wood, and the art made rapid progress with the opportunity of dissemination on a scale formerly impossible. It is not so much, however, with this, as with the essential art that we have to do, and with its bearing upon the more modern forms of engraving, though it is interesting to observe that the art of engraving upon metal arose about the same time as the art of printing from moveable types, yet independently of it.

Now, the essential character of a type, whether upon wood or metal, is that the impression is obtained from a raised design, the wood cutter cutting down the general surface of his block, and leaving the letter or design *in relief*. But in the other forms of engraving the method is followed of cutting the design *into*, or *below*, the general surface of the metal. The principle is vitally different, and this form of engraving was, so to speak, an accidental discovery. It arose in the early part of the fifteenth century, in connection with the art of the silversmith, who was accustomed to engrave designs upon silver, for decorative purposes by means of *incised lines*. He cut his design into the metal, and there arose a method of giving effect to it by filling the lines with a mixture of silver and lead, which was of a blackish hue, and so gave effect to the brightness of the silver. Such an early "arrangement in black and white" was called a *niello*, from the Latin word *nigellum*, a diminutive of *niger*, black. Now it happened, naturally, that the workman desired to see how his work progressed, but the means of doing so were not very obvious until Maso Finiguerra, an Italian silversmith, or rather, artist in silver, invented a method of taking a proof. He would make an impression of the silverwork in fine earth, and would take from this a cast, which he obtained by pouring liquid sulphur on the impression. Rubbing lamp-black mixed with oil, printer's ink in fact, into this cast, he obtained a kind of copy of the original, and he was able to foresee approximately what his work would be like when the lines were filled in with the lead mixture and the *niello* completed. His object was, of course, to avoid the necessity of filling in the darks with the solid lead until the engraved work was completed to his satisfaction. But presently he went a step further, and discovered that he could also obtain a proof by filling in the work on the silver itself with the printer's ink and taking an impression upon a sheet of damp paper. This was a very simple and obvious development of the print from the cast, but it was fraught with great results, for the ability to obtain, in a simple way, a proof that was a faithful reproduction of the engraved work upon the silver, naturally suggested the means of doing so from other metal surfaces, and further developments of the idea soon followed.

Such was the simple beginning of the art of engraving upon metals for printing purposes, and the art of line engraving, which was a tool process, arising as it did out of that of the silversmith,

naturally developed first, and was an established art about the middle of this century, the fifteenth. Besides, the "manner" which was natural to the line engraver was more in accordance with the spirit of those early times in art matters. The day of the impressionist was not yet. When, however, *aqua fortis* was first adapted to the engraver's purpose seems to be a matter of doubt, but it was almost certainly a later development.

For a long time the engraver laboured under great disadvantages, because the only method of obtaining a proof was by means of hand pressure—at first by simple pressure, and afterwards by means of the hand-roller—but neither method gave satisfactory results. For it must be pointed out here that, just as the two kinds of engraving were essentially different, being on the one hand a method of leaving the design in relief, and on the other a method of obtaining the design by incised lines, so the methods of printing were essentially different. In the former case, the design was printed from the raised surface, with uniform and comparatively light pressure; in the other, the design was printed from the incised lines, which required heavy pressure. In the former case, the ink was applied to the raised design only, and did not touch the general surface; in the latter, the general surface had to be inked with the rest and cleaned off, the ink being left in the incised lines. This, as can easily be understood, was a less simple process, and, consequently, a later development, and it was only upon the invention of the roller-press, with its long powerful arms, that sufficient pressure was obtained to drive the paper into the finest lines, and so obtain a satisfactory proof. But the invention of the press marked a great advance, and severed the already strained connection of engraving with the art of the silversmith, and engraving soon became technically a perfect art.

It has been pointed out that there was an essential difference between the earlier method of cutting designs in relief, and the later process of cutting designs into the metal, and I wish here to point out a very vital difference in the expression of the two kinds of engraving when printed. In the woodcut, the only method of obtaining *value*—that is to say, the strength of the foreground on the one hand, and the delicacy of the sky and distance on the other, with all the intermediary values—was by using thick or thin lines to express them. Now it will easily be understood that this was an imperfect method, because whatever difference there might be in the thickness of the lines, the ink was always of the same density, and a thin line, however thin, was always of the same tone, of the same blackness, as the thick one. This is necessarily the case with surface printing. But in an engraving, or etching, we go a step further, and this further step makes all the difference in the world. A thin engraved line is not only thin, but it is shallow, and it holds a volume of ink so thin as to be semi-transparent. On the other hand, a heavy line is also deep, and it holds a correspondingly solid body of ink. In the print, the thin line from the engraved plate is much more delicate than that from the woodcut, and no heavy line in woodcut does, or can, print

with the rich blackness of the strongly engraved or bitten line. And it is herein that engraving upon metal is so much more complete an art than the earlier and simpler one.

Again, it may be advisable to point out the essential difference between engraving and etching. The art of line engraving, to make the common distinction, is the art of engraving upon, or rather into, a metal surface by means of a cutting tool. The burin, as the line engraver's tool is called, cuts a clean, sharp line into the copper, or other metal, while in the art of etching the acid eats a more or less rough line, which is altogether different in character and expression. The former is cold, classical, proper; the latter is free and unrestrained, Bohemian if you like, but living, warm-hearted, passionate; and the difference in the expression of the line lies in the nature of the process. In engraving proper, the line, on account of the resistance of the metal, is cut by a slow, laborious process, which is entirely opposed to that free play of the artistic spirit under which the best work in art is done. It is laboured, not spontaneous. On the other hand, in etching, the needle glides over the copper and cuts the wax surface without resistance; it is as free in fact as the pencil upon paper, freer than the pen, and the result is a vivacity of line and force of expression which the colder art knows not. Bearing in mind this difference, it is easy to understand how the former process has come to be applied mainly to reproductive work. In the early days, men like Dürer, Van Leyden, Mantegna, and others, engraved and etched their own designs, and translated their own ideas in their own way, but in course of time line engraving has gradually come to be applied entirely, or almost so, to the reproduction of the works of the painter, and the engraver is no longer an original artist but a copyist. His whole time and attention are directed to the production, laboriously and exactly, of every tone in the work before him. The qualities required in him are essentially of the technical kind, and he has ceased to be a creative artist. This is all right and proper, for while we have, perhaps, lost the original work of many a good engraver, we have gained a knowledge of the works of the great masters, which would otherwise have come to us more slowly, or not at all. But this has had an unfortunate effect upon modern etching, for since its revival in the popular estimation, the windows of our art dealers have been flooded with so-called "etchings" which are essentially engravings in character, but spurious at that, and which have no right to the title of "etchings" except in the bare fact that they have been engraved with an acid instead of with the engraver's tool. They are not executed in the spirit of the etcher's art, which is to translate, rather than imitate, nature.

It may be mentioned in passing, that the line engraver frequently uses the acid in two ways. Some engravers employ it to partly engrave their work, the lines being subsequently deepened by the burin, and so attaining the character of the pure burin line. In this case the use of the acid is merely a labour-saving appliance, and has nothing to do with the character of the final result. The lines, though



drawn with a free instrument, the needle, are done in the stiff formal manner of the line engraver, with a careful eye to the end in view. Again, many line engravers make free use of the pure acid line in the foreground of their plates, especially for the representation of what we are accustomed to call "picturesque" objects, to which the acid line is suited, but even here the etched line is used in the engraver's manner and in keeping with the work on the rest of the plate, and, though actually bitten with the acid, it is essentially an engraver's line, applied in the engraver's manner, and for the engraver's purpose.

Let me here say that, for the purpose of these papers, I shall use the word "engraver" in the sense of copyist line engraver, and the word "etcher," or better still "painter-etcher," in the sense of the original etcher, who does his own work in the free method of the original artist, who translates nature direct, or carries out his own ideas, rather than imitates the work of other men. It will be my endeavour also to write, as far as in me lies, from the point of view of the latter rather than the former. No good original work can be done in art, or anything else, without that enthusiasm which comes from love of it, and the engraver's method effectually kills all that in the average man.

I hope I shall not be misunderstood as intending to decry the engraver's art. Quite the contrary; it has its proper place. In the work of the best men there is much originality, but this is displayed in their methods of adapting the clean-cut line to the imitation of the tone and colour, the texture, etc., of a picture: their qualities are of the technical kind. But, to give the etcher his due, it is necessary to insist on the distinction that the engraver's art is imitative, not creative, and that is all I mean to say. The essential nature of the process is opposed to the free execution of original work, and the engraver becomes a "copyist-engraver," as Mr. Haden calls him, and not an original engraver.

Before passing from this part of the subject, it may be mentioned here with advantage, not only that the ancient art of etching, which has been much neglected for a long time, has been greatly revived in modern times, but that all forms of original engraving, as opposed to reproductive work, are steadily receiving more and more recognition from year to year. One important result of this revival and recognition is that, in the year 1880, was formed the Society of Painter-Etchers, its object being to encourage all forms of original, as opposed to reproductive, engraving; "not merely the restoration of original etching, but the re-infusion into all forms of engraver's work of those personal qualities which, in the hands of the great masters of painting, made engraving a fine art." I am not quite sure that I am right in saying that the foundation of the Painter-Etchers' Society is altogether the result of this revival; for there is no doubt that the influence of the Society from its foundation, and indeed of some of its members long before, has had much to do with the increased importance attached to original work on metal. But it may safely be said that the formation of the Society was, in part at least, the result of the general revival

of interest in etching during the last generation or so, while, on the other hand, the Society has reacted to an important extent upon the public taste during the last decade, and has helped to lead it in the right direction. What was at first an effect, or partly so, has become in turn a cause, acting and reacting with and upon this renewed interest in the too much neglected art of original engraving upon metal with acid.

The Society includes in its list of members nearly all the leading etchers of the day. Here is a short extract from the presidential address for 1890, delivered to the Society by Mr. Francis Seymour Haden, one of the greatest etchers of our time. He says:—"We all know what an ordinary engraving is, and associate it quite correctly with a reproduction—more or less able but by means more or less mechanical—of a picture or design, in the painting or inception of which the engraver has had no share; but very few of us, I imagine, are aware that up to the date of Vandyke, it was the painter himself who was his own engraver, and that the class of engraver as we now know him had no existence—that he is in fact but a product of that degradation of all the arts which followed the execution of Charles the First, and from which, as to engraving at least, they cannot even yet be said to have wholly recovered. Well, it is on the revival of this great-master engraving, this original engraving, this painter-engraving—or, as it is more commonly called from the process usually employed in its production, this painter-etching—that the foundations of this Society are laid; a revival which should interest, we think, every true artist. We wished, indeed, in the first instance, that the Royal Academy should have the credit of this revival, and at all events, hoped that we might look to that body for help to bring it about. We did not obtain it. For twenty years we sent in to the Academy original etchings which have since obtained a European reputation, and which, only the other day, obtained at the hands of an international jury sitting in Paris, the highest honours which they had in their power to award. In the Royal Academy they met with no encouragement whatever. When a vacancy occurred among the members, it was supplied by the election of the copyist engraver, and never by the original engraver; so that at last, worn out by the unequal struggle, we abandoned further efforts and formed the present Society." I may just add that the Society is the only leading Society of Etchers in the kingdom, and had conferred upon it recently the style and title of "The Royal Society of Painter-Etchers." We now, therefore, as far as royal favour goes, hold our heads just as high as the Royal Academy does; a sort of retributive justice, for the Royal Academy, in its treatment of etchers and etchings, was only consistent with its usual conservative methods of recognising its own members, at the expense of much that is good, often better, among younger and outside men. The Royal Academy, as is well known, is a close corporation, with, so to speak, vested interests, and does not, like the Paris Salon, encourage art from a national and international point of view, as from its position it ought to do.

*[To be continued.]*

## Half-tone Photo-Block Printing.

By COLONEL J. WATERHOUSE, S.C., *Assistant Surveyor-General of India.*



HE problem of breaking up the continuous gradation of the photographic image of half-tone subjects, so as to render it suitable for various methods of press printing, was one which exercised the ingenuity

of photo-mechanical printers for many years; but so far as photo-block printing in half-tones is concerned, nothing really practical was done till Meisenbach, of Munich, brought out his so-called "autotype" process, in which the image was broken up by a series of lines crossing each other at right angles or thereabouts, and forming a number of dots and spaces varying in size and nature according to the depth of shade in various parts of the picture. The use of lined screens and network of various kinds for this purpose was not by any means new; but whereas, in most of the earlier methods proposed, the photographic image was merely cut up into small spaces by network, or broken up by the wrinkling of a gelatine film, in Meisenbach's method there was a distinct independent gradation given to the image by the crosslines or dots being of different thicknesses, corresponding to the gradation of the picture. This was an enormous advance, and, although the actual methods of employing the ruled screens in use by different operators following Meisenbach's system may vary, the principle of obtaining this gradation by diffusion or diffraction is the same in all, the amount of it being regulated by the distance of the ruled screen from the original, or from the sensitive plate, and the amount of light passing through it, as well as by the relative proportion of opaque line and clear space forming the ruling.

Very little is known of the details of the various processes employed by European or American photo-block etchers, and so I propose to confine myself to the process we have followed here in Calcutta, which will stand comparison with much of the work done elsewhere, though not yet equal to the best, and may have some points of originality to commend it. It is based on the ordinary intaglio photo-etching process followed in Survey of India Office, and has been worked out by my assistants, Mr. A. W. Turner and Mr. J. T. Meade, under my supervision, and has the advantage of not requiring a reversed negative. The first necessity is a good ruled screen. We originally tried reproducing some special printed crossed lines I obtained from Europe. These did fairly well, and have the advantage of allowing screens of varying closeness to be easily and cheaply prepared from one ruled original; but it is very difficult to secure evenness of tint and freedom from spots and defects which mar the beauty and perfection of the screens, and consequently of the images produced from them. Some trials were also made by Mr. Turner in the office, of ruling screens on sheets of plate-glass evenly coated with indiarubber dusted over with fine plumbago, which gives a very opaque film easily cut with a point

in the ruling machine. While in Europe last year, I obtained from America some glass ruled screens from two makers, one of whom produces his screens direct on glass, and the other by photography. Both of these kinds of screens have given much better results than anything we have tried before, and with one of the finest screens ruled on glass—150 lines to the inch, which Mr. Levy kindly sent me for trial—the process seemed to go almost automatically.

The usual way of using these screens is to place them in front of the sensitive plate, leaving a small space between, which may either be fixed or varied according to the subject to be reproduced; or the screen may be placed in front of a transparency of the subject to be introduced, and a negative made in the copying camera. I have not yet been able to go into this subject myself, and so can say little about the best methods of using the screens, and the effects that may be produced by various ways of working. The subject is a very interesting one, and I hope to be able to say more about it hereafter. The negatives are usually taken by the wet collodion process as giving the clearest and sharpest results, and have to be intensified in the same way as ordinary black and white negatives, so that the blacks may be nearly opaque and the clear spaces as transparent as possible. The best way of doing this is with copper bromide and silver nitrate, followed, if necessary, by treatment with hydrosulphate of ammonia. The negative should show an image in good gradation, but broken up into a network enclosing small points, varying in size and character according to the amount of exposure received in different parts of the film. In the darkest parts of the negative, which represent the lights or white spaces of the finished print, these points have the appearance of small transparent dots joined by opaque spaces; and as the negative increases in transparency, corresponding to the increasing depths of shade in the print, the transparent dots increase in size and the opaque spaces decrease, till in the deepest shadows the distribution of light and shade in the dots and spaces is quite reversed, and the negative image is formed by very small opaque dots joined by transparent spaces, and finally, in the deepest shadows of all, by complete transparency.

Having obtained a good grained negative, the rest of the process is very simple. The image may be etched on copper or zinc plates in various ways, using either a thin film of asphalt or of bichromated albumen, etc., as the sensitive surface. It must be noted, however, that if the image is printed directly on the metal surface a reversed negative will be required. Zinc plates seem to be ordinarily used for these blocks, and offer more facilities for deep biting when necessary; but we have found thin copper plates in many ways more convenient, and we make them easily for ourselves by electrotyping from a highly polished copper plate. The plates we use are about the thickness of a stout card, quite flexible, and can easily be cut with shears.





DRAWN AND LITHOGRAPHED BY T. H. SALE & CO., MANCHESTER, FOR  
**MESSRS. MANDER BROTHERS, WOLVERHAMPTON,**  
 AND LITHOGRAPHED WITH MANDERS' INKS.

THE NUMBERED SPECIMENS AT THE SIDE ARE THE ORIGINAL INKS UNALTERED. THE NUMBERS ARE THOSE  
 GIVEN BY MESSRS. MANDER IN THEIR PRICE LIST.



The first thing is to fix a fine dust grain of powdered asphaltum upon the clean, polished surface of the copper plate, just in the same way as is done for the ordinary intaglio photo-etching process. The grain should be very fine, so as to be eaten away during the etching of the image, but just sufficient to hold down the gelatine image. A print is now taken from the grained negative upon the ordinary standard brown autotype tissue, transferred under water to the prepared thin copper plate, and developed in hot water in the ordinary way. A quantity of prints may be developed upon the same plate, and etched together, or separately, according to the requirements of the various subjects. The pigment prints should be made in sunshine, and require an exposure of about two minutes. After development the images are dried off in the usual way with spirits of wine, and parts not requiring to be etched, as well as the back of the plate, are printed over with asphalt varnish to protect them from the etching fluid. Before etching, the prints should be carefully examined to see that there are no defective parts, and especially that the grain is crisp and sharp; the slightest want of contact in the printing frame will spoil the result.

The copper plate, bearing the gelatine image, is now placed in a solution of perchloride of iron at 44° Baumé, and the process of etching is carefully watched, the biting being allowed to continue for ten or twelve minutes after the first signs of action, or until the greater part of the image is etched; the plate is then placed in a weaker solution of perchloride at 40° Baumé, and left in this for another six or eight minutes, until every part of the image has been eaten into the copper except the deepest shadows. The gelatine image is then washed off in a strong current of water, and the plate cleaned with ammonia and chalk. If the etching has been properly carried out, a perfect image in relief will now be obtained, with every line and dot of the grained negative reproduced clear and sharp. One advantage of this mode of etching is that the grain is not underbitten; the finest lines and dots are always perfect, because, if the finer parts should be over-etched, the image is attacked by the perchloride on the surface without removing the gelatine film, as would be the case in etching an image in asphalt or fatty ink. The result is that the lights of the picture are slightly below the level of the deep shadows, but not sufficiently so to interfere with the printing; in fact, this may assist it, by causing the deeper shadows to take up more ink than the lights, and so form a natural graduated method of overlaying, so important in typographic printing. The plate now obtained, though fairly deep, is not sufficiently so for printing purposes, and recourse must be had to rebiting, which is the most important and delicate part of the process. For this purpose a hard gelatine or smooth rubber roller should be used, and the image is very carefully rolled up with an ink composed of good lithographic ink and black wax thinned down with sufficient lithographic varnish to just make it workable on the slab, the ink being as hard as possible. The black wax composition is similar to that used for making electrotyping moulds, and is made of:—

Spermaceti	56 parts.
Stearic acid	26 „
White wax	24 „
Asphalt	9 „

melted together.

With due care the image is easily rolled up with this composition, and it forms such a powerful resist to the etching solution that a very thin film will be found sufficient to protect the image. After rolling in, the plate is slightly warmed over a gas stove and the back of it and the margins of the picture again painted over with asphalt varnish. It is then put into a 38° Baumé solution of perchloride of iron, and should stand about two minutes' etching; this will deepen the image considerably, but may have to be repeated a second and sometimes a third time before sufficient depth is obtained, care being taken that between each biting the plate is thoroughly cleaned with turpentine and benzole. A great deal can be done with the plate to improve it during the process of rebiting, by painting out and biting only such parts of the plate as may require it; but this depends upon the requirements of the subject and the skill of the operator.

When the etching is quite finished, the plate is cut to the size required, leaving, as a rule, a narrow black line or border round the subject, and it is then ready for mounting. Mr. Turner has adopted an ingenious way of doing this which may be novel. The copper plates being very thin are fastened down to blocks of wood, type high, with strong bichromated gelatine, and hold extremely well, though zinc plates treated the same way do not seem to hold so well. The back of the plate is first carefully cleaned with turpentine and afterwards with a strong solution of caustic potash, in order to free it from all traces of greasy matter which might prevent adherence. It is then dried, and a sheet of white tissue paper is attached to it with a solution of:—

Gelatine	8 parts.
Water	32 „
Potash bichromate	1 part.

Upon the wooden block a sheet of thin drawing paper is attached with the same solution. The tissue paper on the back of the plate and the paper on the wooden block are now thickly coated with the bichromate solution, and the two surfaces brought into close contact with each other and placed under pressure. A piece of oiled paper is laid on a sheet of thick glass, and the blocks laid face downward upon it. A number of sheets of thick plate glass are then piled on, and the whole left till the next day, when it will be found that the copper plates are firmly attached to the wood blocks, and quite level. A proof is then taken, and, if necessary, the typographic images can be touched up with a roulette or graver to bring out lights, or with a burnisher to deepen shadows.

The printing of these blocks seems to offer no great difficulties, provided the wood does not warp and the surface remains level. The image, being broken up all over into a series of minute dots and spaces, offers a good support for the roller, and the images generally print very sharp and clear. The quality of the paper has, however, a very great influence on the result, and the best impressions are



obtained on highly-glazed paper. Eder's *Jahrbuch* for this year contains two illustrations printed from the same block by Meisenbach—one on the highly-glazed paper being of a rich, full tone, and almost as perfect in gradation of light and shade as a collotype print; while the other, printed on ordinary paper from the same block, is poor, flat, and spotty. Enamelled paper, as used for collotype, also gives good impressions, but they are easily damaged. There does not seem to be the same necessity for overlaying as with ordinary deep-cut blocks, though it is probable that a skilful use of this auxiliary might aid in producing the finest results a block would be capable of giving. —*Photographic News*.

## New Application of Photography to Litho Printing.

MADE POSSIBLE IN THE RECENT PROCESS OF DR. A. MULLER-JACOBS.



METHOD has just been patented in the United States, for producing photographs, images and pictures on hard surfaces, as glass, metal, porcelain, etc., and the invention consists in applying to such a surface a coating of a solution

of guaiaretic acid or of the guaiaretate of a metal or organic base and submitting the so-coated surface under a photographic negative or a transparent positive of the image to the action of the light, whereby the parts of the coating exposed to the light through the unaffected parts of the negative or transparent positive become hard and insoluble, then developing the coated surface, and finally applying to the film a suitable acid, whereby the picture is etched into the surface. The hard portions of the film which are not affected by the acid are then removed.

Dr. Jacobs has found that the guaiaretic acid ( $C_{20}H_{26}O_4$ ) or its metallic salts, or those made of guaiaretic acid with organic bases, by exposure to light change their properties as to solubility and as to resistance to oxidising agents. The guaiaretic acid, as well known, is, freshly prepared, soluble in alcohol, ether, bisulphide of carbon, chloroform, acetic acid, benzole, and other substances; but by exposure to light it becomes less or entirely insoluble in these substances, like asphaltum or resistance—that is to say, the salts of abietic acid ( $C_{14}H_{10}O_5$ ). As far as his researches go guaiaconic acid ( $C_{12}H_{22}O_6$ ) is formed by this action, which latter is still more oxidised by certain likewise-acting substances. A similar effect takes place by exposing the salts of guaiaretic acid with metals or organic bases, also the chlorine, bromine, and iodine substitution products or the corresponding salts to the action of the light. Certain colours—for instance, aniline-violet, magenta-red, safranine—when combined in minute quantities with guaiaretic acid or salts accelerate the action of the light—*i.e.*, they act as sensitisers. He furthermore found that a thin coating of this acid or its salts laid

upon a hard surface and exposed to the light for a certain time becomes impermeable by dilute universal or organic acids. These properties of guaiaretic acid or its salts, as aforesaid, render them useful for the production or reproduction of pictures, photographs, ornaments, etc., by means of the actinic rays.

In carrying out his invention to produce a photograph, picture, image, or ornaments on a hard surface, as metal, porcelain, glass, lithographic stone, etc., he first dissolves 100 parts of crystallised guaiaretic acid, or, to obtain a more sensitive film, 120 parts of dry amorphous guaiaretate of silver, or of a corresponding quantity of the zinc, lead, or magnesium salt (which latter are less sensitive than the silver salt) in 500 parts of pure benzole. He may use the salts coloured with three to four per cent. of aniline-violet or another aniline colour or colours. He then prepares a rubber solution by dissolving seven and one-half parts of dry caoutchouc to 500 of benzole. He may also use a collodion solution instead of rubber, the collodion solution containing one to two per cent. of nitro-cellulose; but he prefers the above-described composition of rubber. Both solutions are then thoroughly mixed together, and the well-cleaned surface on which the picture is to be produced is carefully coated in the dark with the mixture thus obtained. Then the so-coated surface is exposed under a negative or transparent positive to the action of light, a ten to twelve minutes' exposure to direct sunlight being sufficient to harden the exposed parts and to render them insoluble in the developing bath, and the best he found to be composed of a mixture of one part of benzole and five parts of spirit or turpentine. Of course, other developers can be used. The parts of the film which are not affected by the action of the light are thereby removed and the picture appears on the surface. The plate is then dried and etched by appropriate acids, according to the nature of the surface to which the sensitive film is applied; or it may be printed from directly with lithographic ink.

The guaiaretic acid which he uses is prepared in the following way:—Two parts of guaiacum are dissolved in ten parts of alcohol, filtered, and concentrated to a thin syrupy solution. Then it is mixed with a warm concentrated solution of one part of potassium hydrate. After twenty-four hours' standing it forms a mass of the consistency of pulp and is pressed through a filtering cloth. The remainder is thoroughly washed first with alcohol and then with water, and crystallised by means of dilute alcohol.

*The Lithographic Journal*, New York, publishes the following process for the manufacture of liquid bronze, which is patented by T. E. Stroschein, Berlin, Germany:—Melt gum damar, together with carbonate of potash; reduce the mixture then to a very fine powder and expose this powder to a temperature of about 125 degrees Fahrenheit for several minutes. The alkaloid resin thus obtained is dissolved in distilled mineral oil, while boiling at 300 degrees Fahrenheit. Any acid contained in the mineral oil must have been previously neutralised by conducting ammoniac gases through it. A mixture of this preparation with any bronze powder will keep for a long time.



## Book Notes.

**"HOPS AND HOPPING,"** by John B. Marsh (Raithby, Lawrence & Co., Limited, 1 Imperial-buildings, E.C.; small 4to; 7/6), is a dainty specimen of book-making, excellently got-up in every respect. Though in a general way something is known of the hop cultivation and the workers, yet no work on the subject has previously appeared. Mr. Marsh's book is devoted to a careful study of the question, giving much valuable and interesting matter in a pleasant chatty style. Part I. treats of the districts in Kent more especially devoted to hop cultivation, and the charming scenery and many places of interest receive due recognition. Part II. is descriptive of the cultivation of the plant, and the details of cost, labour, profits, and the incidents relative to the growth and after preparation are clearly dealt with. Part III. is devoted to the workers themselves, and a graphic description is given of the annual "hopper" invasion of Kent, the doings and misdoings of the invaders, their modes of travel, earnings, work, the manner in which they live, and, in fact, the whole philosophy of the hopper's life may be found here set forth. The illustrations are a special feature of the book, some forty views, many of them full-page, with original head and tail pieces and initials, and a splendid chromotype title-page, make a collection of pictures and designs in the highest degree suitable for the purpose. The landscapes are from the pencil of a rising young Kent artist, E. T. D. Stevens, and the capital figure studies are by Julian Rochfort, of *Pall Mall Gazette* fame. A tastefully illuminated cover completes a work alike creditable to author and printer. A daintier specimen of bookmaking it would be difficult to find.

"THE AMATEUR PHOTOGRAPHER'S ANNUAL," 1892 (Hazell, Watson & Viney, Ltd., 1 Creed-lane, E.C.), is the second issue of this compendium of photographic information. It forms a handy book of reference on all matters photographic, and is neatly and carefully printed, and well edited. An introductory chapter records the advances made in the study of photography in natural colours, and the general and



THE MEDWAY, NEAR FARLEIGH.

particular advances in that research. A chapter dealing with the progress in photographic science gives a valuable summary of the year's work in the direction of scientific aspects, photo-mechanics, actinism and photometry, meteorological and astronomical photography, apparatus testing, orthochromatic photography, and their various developments. As a

well up-to-date record, this portion of the book is invaluable. A specially interesting and useful paper treats of architectural photography, and is well illustrated by some splendid examples from the author's own negatives, forming a very readable and useful article. Another suggestive and practical article treats of the form and composition of landscape photography, an article which will be largely appreciated, and the numerous illustrations and careful references give additional value to the notes. A voluminous section acts as a holiday guide for photographers, giving lists of dealers, dark-rooms available, photographic societies, and notes on places worthy of the photographer's visit. The list is a very complete one, and copiously illustrated with a wide range of pleasing views. A further section, also illustrated, discusses photographic apparatus, forming an invaluable assistant to prospective purchasers. The volume appropriately concludes with a list of English and foreign works treating of the art. A word of praise must be given to the general character of the illustrations contained in the book. Many processes and details are illustrated, and figure and still-life subjects are alike attractive. The bromide print, the silver print, and the collotypes are exceptionally dainty specimens of work, while as for the "process" blocks, their name is legion, and throughout they are characterised by good taste in subject and treatment, very many of them also by intelligent care in printing. The Annual worthily fills an important place in the literature of photography, and we can heartily recommend it to the notice of our numerous friends who take an active interest in the fascinating art.

**ONION JUICE AS A PASTE.**—A very convenient mucilage can be made out of onion juice. A good-sized Spanish onion, after being boiled for a short time, will yield, on being pressed, a large quantity of very adhesive fluid. This is used extensively in various trades for pasting paper on tin, or zinc, or even glass, and the tenacity with which it holds would surprise anyone on making the first attempt. It is the cheapest and best mucilage for such purposes, and answers just as well as many of the more costly and patent cements.

**WRITING ON BLUE PRINTS.**—It is pretty generally known that one can write on blue prints with a solution of soda and water, the writing coming out white; but it is not generally known that one can write equally as well with red ink if a little caustic soda has been dropped into the red ink bottle. A little piece of caustic soda, about as large as an ordinary white bean, is sufficient for a bottle of red ink, such as draughtsmen use, or the ordinary desk-size bottle.

THE official souvenir picture of the Columbian Exposition grounds will be published by John A. Lowell & Co., of Boston. The firm is now preparing the steel plate for this souvenir, which will be 16 × 27 inches in size, to frame up 24 × 34 inches. This engraving is ordered by the Exposition management, and will be sold on the grounds at a popular price during the running of the fair. We hope to give a facsimile of it when ready.

## ~ The Bartos Process ~

FOR THE PRODUCTION OF HALF-TONE STIPPLE FOR PHOTO-LITHOGRAPHY.



THIS process belongs to that class of photo-mechanical manipulations in which the half-tone necessary for printing is not obtained through photography, but afterwards through mechanical applications, that is, by means of the sandblast. The half-tone is thus not based upon optical principles, as in Albortype, etc., but it is similar to the Pretsch system (in which a printing grain is obtained by roughing the layer of chromo-gelatine), and other systems where the same result is obtained by dusting the printing surface with asphaltum, etc.

Bartos employs the negative taken from nature to make a pigment positive; this is transferred to the litho stone if desired for photo-lithography, or to the zinc plate if for phototypy, just like the diapositive in heliogravure. After first coating the stone or plate with a layer of varnish, the grain or half-tone is then produced by means of the sandblast.

The process is patented and is described as follows: This invention is based upon the combination of two processes to produce a new technical result. The first is the employment of a weak sandblast of peculiar construction, and the second is the coating of the stone or plate with varnish previous to transferring the photographic film thereon. A well-polished lithographic stone or zinc plate is covered with a thin layer of varnish which is made of the following ingredients: three hundred parts of chloroform, five parts of gum mastic, ten parts of asphaltum, three hundred parts of benzine, and two parts of linseed oil. Upon the stone or plate thus prepared a photographic film in half-tone is then transferred. The film, after it has become perfectly dry, is treated with a mixture of thirty-five parts of glycerine, twenty-five parts of water, and two parts of alum, the fluid to remain about five minutes on the film and is then removed by means of blotting paper. The effect of this operation is to render the film brittle and susceptible to the sandblast, the sand beating upon the picture, which is slightly in relief, destroying it and affecting the underlying coat of varnish. After removing the remnants of the film, the picture will appear in all its details in grain on the coat of varnish perforating the same according to the intensity of the light or shadow.

The etching fluid employed consists of 1½ ounces of phosphoric acid and one quart of water. It is left for two minutes on the stone, is washed off with water, and the surface is then coated with a five per cent solution of gum arabic and allowed to dry. The layer of varnish is then removed by means of a tuft of cotton and some turpentine, and the stone, when dry, is rolled up with lithographic ink, and will then show the picture in its finest details and is ready for printing.—*Lithographic Art Journal*.

THE large show printers and lithographers of America have formed a combination for mutual assistance, representing nineteen important centres.



# The City and Guilds Examination in Lithography, 1892.

## QUESTIONS WORKED OUT.

### ORDINARY GRADE.



QUESTION I.—When work on the stone becomes smutty, taking too much ink, what are the probable causes, and what are the means you would adopt to effect a cure?

ANSWER: Work which by an undue thickening may become smutty and yield heavy impressions, can best be cured by washing out with turpentine, and allowing it to stand in that state for twenty minutes. After careful washing, it must be rolled up gradually with a stiff ink, keeping gum-water on the stone; and when by rolling the work has assumed the character required, discontinue rolling lest the smuttiness again appears, and give the work a strong resin and talc etch. Such treatment, if not effectual, can only be supplemented by scraping, etc., by an artist.

QUESTION II.—What are the qualities most desirable in a copper-plate transfer ink, and how would you secure them in making it?

ANSWER: Copper-plate transfer ink has a somewhat different purpose to either the writer's ink or stone retransfer ink. It must be:—(1) Sufficiently soft to melt readily, without burning, to allow it to be forced into the very finest engraved line. (2) Hard enough, when cool, to resist the pressure it has to pass under when being transferred to stone, without it being smashed. The first quality is attained by using a sufficient quantity of tallow, wax, and soap; whilst the second condition is met also by the wax, supplemented by the addition of pitch.

QUESTION III.—Which is the easier to remove from the stone, the grease or the gum; and what are the reasons on which you base your opinion?

ANSWER: This question has several phases, and according to the age of the grease so is the difficulty to remove it. Nothing could be easier than washing out a new transfer with turpentine, and then washing over with nitric acid, the result of which would be the removal of the grease. But such a method does not apply to an old transfer. The latter would ultimately yield to the treatment, but would deface the stone. Better in this case to polish it off. In the first instance there is comparative ease, in the second, a greater difficulty. With the removal of gum there are just two things necessary. First, thorough washing with cold water and then with hot water; second, the application of some substance which will decompose the gum and thus remove the final traces of it; this latter substance may be either of these dilute solutions, viz., acetic acid, nitric acid, alum, or caustic soda.

To say that the removal of gum is easier than the removal of grease, after the above description, is ambiguous, seeing that new grease can be removed

by the same number of processes, and entailing no more labour, although the cost is slightly greater.

Both substances unite more or less with the material of the stone; the grease if left on, ultimately forming the stronger compound, and being more difficult to remove.

QUESTION IV.—Describe the production of tints by the rubbing-in method.

ANSWER: To rub in a tint, it is necessary to gum out such portions of the stone as it is not desired to touch, then proceed by scraping some artist's chalk into fine shavings, to be kept at hand in a suitable flat tray. Upon a finger is placed a piece of wash leather, and wrapped round it, to give an even under surface. This even side is dipped into the chalk shavings, and a few will adhere. With this supply the wash leather is rubbed regularly over the face of the grained stone. The tint is thus rubbed smoothly in. The supply of chalk on the leather should not be renewed too often, so that there is a better opportunity of rubbing that which is on very smooth. Rubbed tints can be very effectually scraped to give lights, and before rolling up must be etched like other chalk work, attention being given to the strength of the etch as compared with the strength of the tint.

QUESTION V.—How would you produce "faints" or traces upon grained transfer paper for chromo work without injuring the grain?

ANSWER: Off-sets are effectually produced upon grained paper by pulling the impression very lightly in ink upon the grained paper, and then dusting the impression. This is often very successful, but occasionally the ink comes through and causes the off-set to adhere. To prevent this, the stone itself when rolled up, and thoroughly dried, can be dusted, and a dust off-set printed upon the grained paper. Of course, a little judgment must be used not to overdo the pressure whilst printing an off-set, although it is certain, that during the act of transferring work from grained paper, the pressure exercises very little effect in flattening or spoiling the grain.

QUESTION VI.—What disadvantages attend printing from stone when the work has been etched into somewhat high relief?

ANSWER: The disadvantages are so far below the advantages that they may be considered as more imaginary than real. There are the following possibilities from high relief, viz.:—(1) Poor paper may get torn. (2) Thin paper may crease. (3) Heavy pressure from the cylinder may break the work on the stone. (4) The cylinder blanket, damping rollers, and inking rollers may get impressed, and not do their work so well. (5) Thin ink may run down the elevated work, and from the fourth possibility, as above, may result in thicker rather than finer printing. (6) Constant contact with the rollers might break the

work. (7) Acid colours may more readily undermine the work, as may the acids and stale beer used in printing. Experience has shewn that of these possibilities the one numbered (5) is the only one which occurs to any extent. Often, however, "commercial" work is printed on rough paper, and the "feathering" is not noticed. It is only when very thin or smooth paper is used that the feathered lines become appreciable. From stones in very high relief, tin, or other metallic plates can be printed without injury.

**QUESTION VII.**—Name the pigments which should not be mixed with flake white when compounding tint inks.

**ANSWER:** Owing to the chemical nature of flake white, which is a lead derivative, it should not be brought into use with Indian yellow, yellow lake, Italian pink, red lead, crimson and other cochineal lakes, carmine, and indigo.

**QUESTION VIII.**—Describe the method of setting a stone in the machine when it is required to register with one previously printed.

**ANSWER:** To set a colour stone for register, much depends upon the accuracy with which the transferrer puts down the transfers. Some are so carefully put down that it simply needs the first stone to be loosened and lifted for the next to be dropped into the same place and screwed up. Should this not be the case, the machine itself is so marked as to afford a ready means of setting. On the two inside faces of the carriage, at the opposite sides of the machine, are two marks in the metal. Every machine is supplied with a straight-edge or gauge, which serves two purposes, viz., first, to show the height the stone must be raised to, in order that it is in a position to come under the cylinder at a proper pressure; and second, to be used to obtain register. The stone is set in the middle of the machine. The straight-edge is placed across the machine as nearly as possible to bring its two ends immediately over the marks in the carriage already referred to. In this position the straight-edge corresponds exactly with the bottom of the gripper. The previously printed sheet can be placed with its gripped edge flush against the straight-edge, and the stone can be moved into position until either the register lines on the stone are exactly under those on the sheet, or some other well-marked features of the two are brought to correspond. By this means, and the adjustment of the side lay on the feed board, a very close approach to register can be obtained in a few minutes. The final touches will depend upon well-judged tappings and screwings of the side lay and carriage screws.

**QUESTION IX.**—Given shellac, tallow, soap, lamp-black, and wax, what would be the quantities and manipulation necessary to the production of an ink for writing and drawing?

**ANSWER:** The ordinary recipe for a very useful litho writer's ink may be compounded by using equal quantities of shellac, tallow, soap, and wax, with black to suit, as determined in making. To prepare a litho writer's ink, the soap should be first cut into fine

shavings and thoroughly dried. The drying is most effectual when the shavings are put on a plate in an oven. To proceed to make the ink, place the wax and tallow in a clean iron pan, devoid of tin lining, and melt over a hot, clear fire. When melted and stirred well together add the dried soap in small quantities. If the soap had not been previously dried, it would have to be added in very small quantities to allow of the water being expelled. The three ingredients are well mixed, and the heat is kept up. The mixture gradually gives off fumes, which become thicker, and can be set fire to. When this is possible the fumes are allowed to burn until the original bulk is reduced to two-thirds, which, if about 12-oz. be the original bulk, will take nearly half an hour. The shellac is added after the flames have been extinguished. It is added slowly to prevent the whole boiling over. Finally the black, ground in turpentine, or a proportionally larger quantity of good black printing ink, is added. Should the ink require thickening after these additions, it must be done by heating until light-coloured fumes pass off, which must not be ignited. The ink thus prepared can be cast in any shape of moulds, and when cool is ready for use.

**QUESTION X.**—Suppose water be objectionably hard, how can it be improved?

**ANSWER:** Water owes its hardness to the presence of some soluble compound of lime—notably the carbonate. The solution of the carbonate of lime can be readily disturbed by boiling. The carbon dioxide ( $\text{CO}_2$ ), which is a gas, is driven off from the solution, whilst hydrated lime ( $\text{CaOH}_2\text{O}$ ) is left in the vessel, just as found in steam and domestic boilers. The solution of carbonate of lime having been thus removed, the water is far softer than before.

**QUESTION XI.**—Give a formula for transfer paper suitable for transferring to a wet stone.

**ANSWER:** The composition for a transfer paper, which is to be used for wet stone purposes, should contain one of the commoner gelatinous substances, which is readily soluble in cold water. An old and useful recipe consists in soaking one ounce of common glue in water for twelve hours, adding it to a hot starch paste made by mixing four ounces of starch in cold water, then adding boiling water until it thickens. The mixture is well stirred over heat, and put on a good writing paper whilst warm. A trace of cochineal colouring assists in determining the surface side in gaslight.

**QUESTION XII.**—What precautions would you take to insure register at machine when it is required to print the work on the back of a sheet in exact register with that on the front?

**ANSWER:** To adjust a sheet, so that in imposing the other side the pages will back up correctly, the stone should be carefully put into the carriage as though it were being adjusted for register. The sheets having been cut in the first instance in one direction, and the sheets having been fed by a certain edge to the side lay on the feed-board, the same edge must be used for the subsequent backing. Thus, the side lay on the



feed-board on the opposite side to that which was first used must be brought into play, and the edges fed by it. This is the method which most readily effects the purpose, but it will be necessary, as in register work, to finally screw up the stone and side lay to the proper position.

#### HONOURS GRADE.

QUESTION I.—Describe the method of printing colour transparencies for attachment to windows, etc.

ANSWER: The comparatively recent success in printing transparent ornaments, labels, and other advertisements for fastening to window or other glass was made the subject of a patent by Messrs. McCaw, Stevenson & Orr in 1880, and depends upon two things for its brilliancy.

To make the printing look almost as bold by reflected light as an ordinary print on opaque paper, a body of white is printed all over. This tint may be very effectively left out in such places where by reflected light greater depth is required, or by transmitted light greater brilliance is needed. But the printing of this layer of white should not be omitted.

Secondly, after the print is dry it is treated with a solution of some balsam, which renders the paper transparent. This balsam will dry in the paper and become permanent there. The print may be varnished or not. Other than the above deviations, there is not any difference from printing an ordinary chromo lithograph.

QUESTION II.—What defects belong to inks prepared from red pigments derived from the aniline or "coal tar" colours?

ANSWER: Most colours prepared from the coal tar products have a tendency to lose their colour under the effect of strong or even medium light. The material which, by its structure, has the property of reflecting a colour becomes altered in molecular structure, and although the same material is present, its power of reflecting has been destroyed by the action of sunlight to such an extent as to leave it with a dull brown appearance.

This more especially applies to the reds, some of which are still employed by printers, whilst some ink manufacturers use them to give brilliancy to other and more expensive reds. In the latter the change which comes over them by sunlight causes them to have the appearance of a brown ash, which materially destroys the pigment into which they were introduced.

Further, most aniline pigments readily dissolve in the damping water, and stain the stone and dampers.

QUESTION III.—Describe fully the method you would employ in preparing the stone, etc., when required to produce a tint by superposing three transfers from a machine-ruled tint, one over the other, the forms having been gummed out by the draughtsman previous to each transferring.

ANSWER: However long a stone may have been under gum, there are simple and effective methods of preparing it for new work, especially when such new work consists of well-pulled copper-plate transfers from ruled plates. One of the reasons why many

failures occur is the absence of heat to boil water and heat the stone, and without it other artificial means must be employed to secure a sound transfer being made. A method of preparing, which has stood the test of good machine runs, is as follows:—

1. Soak off the gum under running water until there is no further appearance on the stone. Use a sponge, and constantly pass over and over the whole surface to work out every particle which is soluble in cold water.

2. First by dipping in a basin of hot water, and secondly by pouring hot water on the stone; work out all remaining gum by using the sponge. There must be no lack of hot water, and it must be washed with several clean lots of hot water until the stone dries readily by evaporation. Wash and dry several times by evaporation.

3. Place the stone before a good brisk fire, and let its surface become just warm.

After this it can be gummed out, and the ruling transferred in. The stone is again cleaned as before, and the second and third batches of line transfers put in.

If after the second operation (2) the printer has any doubts as to the cleanliness of the stone, it may be washed over with very dilute solutions of either citric acid, nitric acid, or alum. The amount used in either case should not exceed one to twenty of water, and after their use the stone must be again thoroughly cleansed with hot water. If the use of hot water is supposed to thicken the work, it would be well to pull a few impressions off before using hot water, and thus leave only the permanent greasy compound in the stone.

QUESTION IV.—How would you arrange the pages when it is required to print from one stone a 24pp. catalogue?

2	22	22	3	9	61
11	14	15	10	7	18
71	11	91	6	8	21
1	24	21	4	5	20

QUESTION V.—Give your views of the desirability, or the reverse, of washing out chalk drawings with turpentine, previously to rolling them up.

ANSWER: To prepare a stone for proving, it is necessary to clean off the original dirty ink or chalk used by the draughtsman before the greasy compound

in the stone can receive the printing ink and give off impressions containing the full value of the drawing. Such cleaning off requires considerable care, because should such drawing be executed upon a grained stone with a hard chalk, there is certain to be a lot of fine shading and delineation which will not withstand rough usage before it has become thoroughly ingratiated with the stone. Bearing this in mind, it is not advisable after etching and washing the gum off to commence by washing the work all out with turpentine previous to rolling up. It would be very similar to washing out line work executed in fine thin ink, and would most likely result in being unable to bring up the original work as it was intended by the artist. If it is desired to have a chalked stone made ready in a very brief time, then it is better, after etching, to wash off the gum etch; dry; re-gum with pure gum; dry; wash out the work with turpentine on the dry gum; and when dry spread "lithophile" all over the gum. After such treatment the stone can be washed and printed off at once.

QUESTION VI.—Describe the method you adopt when transferring sheets of labels, etc., to secure register, and the nature of the transfer paper you employ.

ANSWER: The most certain method of patching up sheets of colour stones for labels or showcards is by shining up. A sheet of glass with a frame is held almost perpendicular by adjustable supports. Upon this glass is attached a sheet of good enamel paper having a clear impression upon it, taken from the dry keystone. The transfers may be pulled from the colour stones upon a good wet stone transfer paper, or upon a transparent varnished transfer paper, or upon a fine French white transparent transfer paper. Either of these can be made to give good results. The transfers thus pulled are patched exactly in position upon the impression on the glass, the light coming through the paper giving very great assistance to accuracy. To ensure absolute register all colour stones must be patched up to the key, and not to each succeeding print with one, two, or more colours on it; and the transfers must be put down upon cold stone.

QUESTION VII.—What is the method of printing transfer transparencies suitable for magic-lantern slides, and what colours would you use?

ANSWER: The printing of transfer transparencies has much in common with the printing of opaque transfer pictures. The differences are that in transfer transparencies the colours can be printed in their normal order upon the prepared paper, and the final printing of a varnish and opaque backing can be omitted. The colours used must be of a thoroughly transparent character. Good register is necessary without overlapping of colours, and a due regard must be given to the differences arising from the appearance of a colour by reflected and transmitted light.

QUESTION VIII.—Vermilion ink when used to print from copper is likely to become discoloured and to corrode the plate; what would you do to prevent such action when using such ink in printing direct from a copper plate?

ANSWER: However practical the question may appear, yet it seems to be more the outcome of some theory than an absolute practical difficulty which has been met with, and may be met by the average lithographic and copperplate printer. Such, however, is not the case, and one of the most experienced copperplate printers in this country is of opinion that there is no way in which copper-plate impressions can be pulled in *pure* vermilion, owing to the tendency of mercury to deposit upon copper. A way in which many difficulties can be overcome is to submit the copper plate to the process of acierage, but if this were done the fault would only be less in degree, for mercury also deposits upon iron. To obtain a good red from copper plate an ink can be made from rouge de France and burnt sienna.

QUESTION IX.—Describe the process of engraving on copper as applied to card plates, billheads, etc., and sketch the principal tools used.

ANSWER: The method of engraving upon copper has much in common with stone engraving, but requires more detailed treatment. It would be difficult to trace or sketch out a heading for an invoice upon the polished copper. A thin film of wax is therefore laid on by warming the plate and putting wax upon it, which immediately flows over the plate and cools in a thin film. This semi-opaque surface can be sketched or traced upon. The design having thus been comparatively roughly traced on the wax, the characters are next lightly scratched through on to the plate; guiding parallels may also be lightly scratched. The wax is then melted off the plate, leaving the characters of the design scratched on the plate; these scratches are for a guide, upon which the whole work is carefully engraved. Any burred edges are cut off with a scraper, and unsightly scratches are burnished away. Finally the plate is thoroughly polished by rubbing with charcoal dust and oil, worked upon a stump of machine blanket. The plate is then ready for printing, except that if the complete order is to be printed from the copper plate, it should be first steel-faced by electro deposit.

QUESTION X.—What are the qualities desirable in a photographic lens to fit it for copying plans, etc., and how are they accomplished?

ANSWER: For photo-lithographic work of any kind it is essential that every piece of work must be kept absolutely rectangular. Many lenses, especially large ones, will do this, so long as only the centre of the lens is used, but as soon as the circumferential portion of the lenses is brought into play there is a strong aberration or distortion of all straight lines. This difficulty has been overcome by the use of the rectilinear or symmetrical lens. This lens consists in the combination of two lenses, set one at each end of the lens box in front of the camera. These lenses are both concavo-convex, and each should be made up of two concavo-convex lenses, one of crown, the other of flint glass, fitting exactly into one another. The two combined lenses are placed in opposition; that is, with their concave surfaces opposing. Thus lines which converge through the first lens receive a diverging





*Suggestions.*



*Initials  
for Illuminating.*







tendency through the second, and thus become rectilinear in the finished print. In the lens box the aperture for the diaphragm is between the two combined lenses. A further desirable advantage obtained by compound lenses is the definition of the subject resulting from the absence of chromatic aberration.

**QUESTION XI.**—Describe the airbrush and its application to lithography.

**ANSWER:** The airbrush is an apparatus driven by air power. The air power is derived from a reservoir filled by compressed air from a foot-bellows, and the compressed air is conveyed by a tube into a small hand-machine, which is the brush proper. The hand-machine has two outlets, one to set a needle in motion, the other through a nozzle opening over the needle. The needle has a motion similar to that of a sewing-machine needle, but working horizontally. In its inward and outward motion it becomes immersed in a shell-like reservoir of ink, and with this very small supply of ink it is brought under the current of air from the nozzle, and the ink is blown off it in a fine spray. This spray is the desired effect, and by holding the machine near or far from the surface the spray is heavier or finer. The needle is worked at a very high speed, and is constantly bringing plenty of ink from the reservoir.

The spray thus produced has not been applied to lithography as well as at first sight might have appeared. The spray is so fine, and covers so quickly, that when well etched it is difficult to obtain anything but a mealy tint, not suitable to the darker colours. It has, however, been largely employed, and has been quite successful for the purposes required.

**QUESTION XII.**—Suppose a plan has a border line  $14 \times 10$ , what will be the measurement of each side when the plan is reduced to one-half its size (area)? Show how you arrive at the result?

**ANSWER:** The problem may appear to have a somewhat simple solution, but owing to its size it precludes a geometrical solution such as might be applied to many smaller figures, unless the proportions of 14 and 10 are intentionally left without any measurement designation, as inches, feet, etc., and the solution thus left simply as a matter of proportion.

The shortest arithmetical solution is as follows:—

Given a rectangle having its sides 14 and 10 respectively.

The area must be 140, and it is required to show how to obtain a similar rectangle having an area of 70.

In the rectangle, by joining its four corners the figure is cut up into four triangles, and if four similar triangles be substituted for these, but having only one-half the area, then the lines which form the bases of the new triangles can be constructed to form the parallelogram having one half the area of the original parallelogram or rectangle.

Since  $14^2 + 10^2 =$  the square of the diagonal

Then  $196 + 100 =$  " " "  
or  $296 =$  " " "

And  $\sqrt{296} =$  length of diagonal

$\therefore 17.204 =$  " "

Since  $17.204 =$  length of diagonal

Then  $8.602 =$  length of one side of one of the equal triangles constituting the whole rectangle.

Since  $8.602 =$  length of one side of triangle

Then the square root of one-half of  $(8.602)^2$  will equal the length of the side of a similar triangle having half its area, and with its base parallel to one of the sides of original rectangle.

Since  $(8.602)^2 = 73.993404$

Then  $\frac{1}{2}(8.602)^2 = 36.996702$

And  $\sqrt{36.996702} = 6.0825$ , or  $6\frac{1}{12}$  nearly.

The measurement,  $6\frac{1}{12}$ , if set off from the centre of the rectangle along the diagonals, and lines drawn joining the points thus obtained, a rectangle will be constructed having an area of one half of the original rectangle, and having sides 10 and 7 long respectively, as proved in construction.

If, however, a geometrical method be preferred, in which the use of figures is almost ignored, then the following plan can be adopted. In the event of the  $14 \times 10$  being of very large dimensions, small scale drawings can be constructed, and the measurements proportionately increased. Thus, use the  $\frac{1}{4}$ -in. scale, and if the original should be 14 inches or feet, the scale must be read off in inches or feet when the dimensions are found.

Let a line be drawn, representing 14, and its extremities marked AB. Let AB be produced to C, the point C being found by bisecting AB, and adding one-half of AB from the end B. The reason for making it one-half longer is because the proportional parallelogram has to be one-half less in area to the original.

Then bisect AC at D, and from D strike a semicircle having DA and DC as radius.

From B draw a perpendicular line cutting the arc in F. The line BF is one side of the new parallelogram, and can be measured off on the scale. [Its measurement by construction is 10.]

Similarly a line measuring 10 can be produced by one-half, bisected, and a semicircle struck. The perpendicular at the end of 10 being measured for the other side of the parallelogram. [By construction the measurement is 7. Singularly, the measurement of  $14 \times 10$ , when reduced to one-half in area, is the same as taking one-half of the long dimension 14, and multiplying by the original side 10. But this is simply a coincidence, and does not occur in many instances.]



*Re the relative merits of the English and American workman, The American Stationer says:—"There are better engravers and die cutters on the other side, although the work here is of a high order. The reason is this: On the other side a man works at one thing continuously. He engraves plates or cuts dies and does nothing else, and naturally does his particular branch of work as an expert whose hand and eye are continually trained in the same line. Here a man does all sorts of work—a plate and then a die and then something else. He has to be an all-round man, and as a result is not as expert in any of these particular branches as his English brother-workman."*

## Similigravure.



FORTIN's delicate and somewhat remarkable zincographic process, which is already regarded with much favour in Europe, particularly because it greatly facilitates the printing of music sheets, has been titled "similigravure," although far oftener referred to as autocopying. A confessed improvement on several of the methods of phototype making ordinarily practiced, this newer auxiliary in the reproduction of linear designs, aquarelles, and every kind of cameraic picture will soon acquire a wider popularity. Being as desirable as it is ingenious and effective, the general recognition of its merits is assured.

From an interesting report on the development and usefulness of similigravure, recently presented by an expert operator to one of Belgium's scientific associations, it appears that an alloyage or fusion of bichromate and bitumen was, after many failures, successfully accomplished by means of a third substance for which both had affinity, and which the demonstrator simply named as "a greasy ink."

This alloyage was employed as the basis of a rapid process of exposure necessitated by the substitution of quartering for the former less positive methods of plate production.

Sheets of paper, mathematically ruled, quartered or irregularly stippled, are essential for making the autotypic plates, the reduction of which is effected according to the quality of texture desired. The finer the grain or texture of the illustration which is to be reproduced the less depth will be given to the relief plate, and for that reason it will be more difficult to print from when blocked for the press. This explains in a measure the blurred or altogether worthless facsimiles so frequently seen in a certain class of books which are embellished by process cuts.

Grained plates are now made by engraving on glass. When the texture is obtained, all that is necessary is to put it in a double printing frame to be then transferred on glass, which has been collodionised at the same time as the setting.

By a double printing frame is meant one capable of receiving two glasses, separated only by glass quoins of degrees of thickness varying according to the pictorial effect which is desired to be reproduced; for example, by widening the space between the two glasses a stronger stippling can be obtained than when they are close to each other.

The annoyance of handling the glass quoins for whatever adjustment or spacing may be desired is avoided by so constructing a frame as to enable the photographic printer to widen or narrow the space between the two glasses at will.

When using the ligature printing plate it is necessary to lock the frame at a half setting, take it into the darkened room, reverse the ruled plate, and continue the setting.

To prevent the autotype from being too light, a solid, untrcmulous floor, as well as a firm, substantial and accurate apparatus, is required for this procedure.

There is, moreover, in the same collodion setting more or less risk of a change of light, which would affect the regularity of the stippling. It is from this fact that, some lines being more prominent than others, the method has been replaced by quartering, as before noticed.

The sensitive developing now begins, and is step by step completed in the darkened room, where drawings or engravings, the most difficult to reproduce, are transferred to zinc by the bichromatised bitumen process, without the aid of the sun or an electric light. The gradations of the work are as follows:—

Upon a burnished zinc plate a sufficient quantity of the bichromate mixture is poured, as in the process of a collodionised glass plate. It is allowed to decant and dry.

The printing plate and the zinc are then immediately applied under the printing frame for four or five minutes, according to the intensity of the light. Then the zinc is taken out, moderately heated, and promptly dipped into clear water. Afterwards it is washed and wiped dry with a brush made of badger hair or some fine wadding. The result is a faithful reproduction of the printing plate.

All that now remains to be done is to make the facsimile firm, unalterable, and capable of standing a good acid biting. To accomplish the latter the plate is sprinkled with some bitumen, very finely powdered, care being taken to remove any superfluous powder. To make the bitumen adhere to the greasy ink and the bichromate it is immediately warmed, and as soon as the plate cools down there is seen an autotype which is not excelled by the best bitumen exposure, and which will better stand the nitric action. It is not liable to scale, even under the operation of the bitumen, and will stand for two years and more. Nothing then remains to be done except to bring out the engraving in relief by the usual well-known process.

In order to secure the most beautiful and artistic facsimiles it is necessary to have an experienced draughtsman or colourist in the workroom, for the plate is washed after each biting, and, as it has to be inked anew, he must give it those delicate after touches which will allow it to receive the various tints. When submitting the plate again to the bath, it is a fact that only the parts thus treated by the artist will be sunken.

All of the printing plates after they have received the different bittings are arranged in similar form to a staircase. This is done so that a better aspect may be given to the work by flattening down the slopes, which is done by a supplementary action of the mordant. A final operation consists in removing the seams or ridges and a few other irregularities of the surface caused by the first biting. After it is washed, the autotype or similigravure must be slightly inked with a hard roller and compact ink, then submitted to a light bath.

As this concluding manipulation decides the good execution of the printing plate, the utmost care should be directed to its safe and thorough accomplishment.—*The American Bookmaker.*



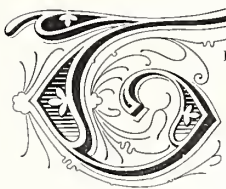
## Pictorial Posters.

IN the *Century* for September Mr. Brander Matthews puts in words the shame many of us must have felt in comparing our English pictorial posters with similar advertisements in France. There is, of course, one French artist in this kind who towers above the rest—M. Jules Chéret, who has filled Paris with those floating female figures, executed chiefly in shades of lemon, blue, and geranium red, thinly and clingingly draped, brilliantly drawn with the boldness and swiftly attained completeness of a Japanese artist, highly elegant and highly sensual, which send one away from Paris with an impression of a city stamped in every quarter with these morsels of brilliant colour and draughtsmanship as if with a trade mark. But there are capable artists at the work besides M. Chéret. Londoners are familiar with the admirably composed monochrome advertisement of the pantomime “L’Enfant Prodigue,” by M. Willette, who ranks, perhaps, second to M. Chéret, unless that place be conceded to M. Grasset, whose colour is as rich and soft as M. Willette’s composition is skilful. In England our posters, as a rule, stop short after fulfilling one of a poster’s two objects. They catch the eye, but they do not satisfy it when caught. They take the attention by violent colour or grotesqueness of subject, but as their decorative interest is slight the impression produced is slight also—the advertisement is forgotten as soon as seen, unlike that sketch from “L’Enfant Prodigue,” which remains pleasantly before the mind for an indefinite time, of course, to the immense benefit of the advertiser. To him, and to the urban public which have to face pictorial posters of one kind or another every day of its life, it is equally important that something should be done to raise our English work of the kind to the French level.

## Permanent Albumen Transparent Colours.

PATENT is being taken out for permanent albumen transparent colours, whereby the process of colouring prints will be so facilitated that we may shortly expect to find everybody painting portraits, landscapes, genre pictures, copies of celebrated masters, and other prints with these transparent colours. The important characteristics of these colours are perfect transparency, their not being affected by light, their durable character and their brilliant surface. They accordingly allow the special features of the print or photograph to produce their full effect. The manufacturer, Günther Wagner, of Hanover, supplies these colours in wide-mouthed bottles, either singly or in boxes, as desired. Twenty-four shades are now ready, as follows:—(1) bright yellow, (2) golden yellow, (3) orange, (4) vermilion, (5) Saturn red, (6) scarlet, (7) carmine, (8) light ochre, (9) dark ochre (blonde hair), (10) Vandyck brown (dark hair), (11) Indian red, (12) sepia, (13) neutral tint, (14) black, (15) ultramarine, (16) Prussian blue, (17) indigo, (18) sky blue, (19) blue-green, (20) violet, (21) bright green, (22) dark green, (23) olive green, (24) flesh colour.

## The Solnhofen Litho Stone Quarry at Hummelberg.



THOUSANDS of years have gone by since the peaceful valleys of Altmühl were filled by raging floods! Who may count the years which it has taken to create the mighty masses of rock out of the all-invading mud, joined with the limestone, coming down from the mountains—those masses of rock which to-day are sent forth from the Solnhofen district into all the world, to bear witness that countless years ago the working of nature was already stupendous? Who may picture the feelings which fill the breast on entering this treasure-house of stone?

For upwards of two hundred years these treasures, discovered by a shepherd lad, have been accessible to man. The boy, it is said, spent his spare time in smoothing the flinsplatten (slabs lying buried in the ground), which were easily to be got at. Hearing from his mother that the committee were in doubt what to use for paving the cathedral of Eichstadt, he went to them with some slabs, and these were chosen as being the finest. Our “Altmeister” Senefelder recognised them as the most useful material for his invention, and by this means they have risen to be a valuable article of commerce. My present task is not to set before you a scientific development, which after all would only rest upon thesis, but to give you a short description of the quarries themselves.

Our illustration takes us into that quarry which is at once the oldest, the most striking, and the best laid out, and is thus well adapted to give our business friends a true and faithful picture of the whole, as other quarries can after all be nothing but a repetition of the same. Through the very extensive excavations which have been going on for many years, these quarries have attained such a size that we could easily imagine ourselves wandering through a second Herculaneum, and it powerfully affects us to see what has been wrung from nature by the hand of man. In the foreground we see, above heaps of refuse and detritus, the stratified formation of the rocks, and thus get some idea of the extent to which we must aid nature; for it must not be imagined that the stones are already in square form and merely await removal. Not so; the rough blocks are broken in the most laborious manner, partly by blasting, and it happens only too frequently that the largest and finest stone is ruined by such manipulation. As all men of the craft know by experience, this is especially the case with slabs which have so-called open veins. Now picture to yourselves these veins, eight to twenty millimetres wide, and you will readily perceive what caution is needed in order not to suffer still greater losses. Most of the quarries are divided into separate portions, each of an area of twelve square feet. The quarry which is represented in the illustration is the property of the parish of Solnhofen, and is split up into sixty-four lots,



as may be clearly seen. From this arises the practice, that should an owner have cleared away the flins (or earth) covering the rocks, and a seam run out beyond the claim of the one, the neighbour on whose side the largest and finest piece lies must mine with him, and is entitled to the profits; but he is bound in the reverse case to act likewise; that is to say, should the same thing happen to his neighbour the latter can recoup himself.

It has frequently happened that a quarry has been bought for a large sum of money, say from two to five thousand pounds sterling, and has not yielded an income of half the sum for which it was bought, and the working of it has had to be abandoned in order to avoid still further loss.

The flinsmasse (or rock) in its natural state is rough hewn on the spot. For this purpose a small hammer with long and pliant handle is generally used, these rough-hewn blocks being taken to the store sheds, partly on trucks, but chiefly on snap carts. Thence they are moved to the polishing sheds to be shorn of their natural covering, to render them better adapted to use in lithography. This is done by polishing them first with the flinty sand from the river Main, and afterwards with the finer kind from the Danube.

The operation, brief though the description of it be, requires the greatest care and strength to manipulate these treasures for our art, and scores of workers must labour upon them ere they reach the required shape and form.

The illustration, in conjunction with this little sketch, will serve to show the origin of the material with which we are so familiar by daily labour in our art.

The four sides of the stones, after grinding, are smoothed with a long-handled toothed hammer and chisel; thinner slabs are eventually fastened on with cement, and this is done with such skill that the eye of many a craftsman and connoisseur has been deceived. After this, the stones are brought to the store sheds, where, sorted into different qualities, they await the buyer.

The great extension and lucrative working of these quarries was not reached until Senefelder, the creator of the lithographic art, appeared before the world with his invention, and drew attention to the stone. Previously, the finest and largest stones, since there was no demand for them, were merely broken up or thrown among refuse and detritus, whilst the thinner kinds were almost exclusively used for the paving of churches and the like; but with the extension of lithography, and when it was found that the whole world had to buy in Solnhofen, then it was that the working of the quarries developed to their present extent.

Our illustration gives a good view of the Solnhofen Quarries as they exist at the present day, taken from a negative prepared by Mr. J. Scholefield, of Bradford, and printed by the Photophane Co.'s well known and beautiful process. The view is scarcely good enough to show the process at its best, but we are arranging for the Company to reproduce a real art supplement for us for an early number. As we write we have before us a selection of examples of Photophane of

the most exquisite character—most of them real gems of art work. It may be useful as well as interesting to many of our readers to know of the adaptability and superiority of the "Photophane" process, when compared with similar ink printing processes. As is well known, it is a variation of and in many respects an improvement on collotype. Photophane is rapidly gaining in favour, being a really perfect form of reproduction from photographic negatives, and is unsurpassed for brilliancy, permanency, and perfection. For the multiplication by the thousand of copies of portraits, family groups, residences, animal subjects, views, book illustrations, and every kind of illustrative work, as well as for commercial purposes, it is unsurpassed.

The truthfulness of "Photophane" reproductions is universally recognised, as well as the quickness with which results are obtained, the increased speed of printing compared with other processes, and, lastly, the very moderate cost.

The Photophane Co.'s new works at Brockley, S.E., which they have recently completed, are very commodious, and some thousands of pounds have been spent in fitting them up and in plant for the development of the process. The machinery is all of the most modern construction, and with the aid of the electric light, which is just about to be laid down, a large increase of business may be confidently expected.

### Process for Tinting Photographs.

MONSIEUR PHILLIAS, secretary of the Society of Photographic Studies, has brought before that body a process of tinting photographs, which is, to a certain extent, interesting, and may be of importance, if the stability of the colours can be assured. The process is alike applicable to paper and to films. A sensitising bath is employed, consisting largely of bichromate of ammonium, to which is added some other salts. The paper, or film, is soaked in this bath, after which it is dried in darkness at a very low temperature. Exposure is then made under a negative, until all the details of the picture are well brought out. After this, the print is thoroughly washed, to completely remove the yellow salt. It is then placed in a tinting bath for ten or fifteen minutes, which is maintained at a temperature of 90° C. This done, the picture is once more rinsed, and if the tints are not very bright it is passed through an acid bath. The colours employed are mostly those produced from coal tars, and we need hardly add that they are extremely bright.

For a great many purposes it is advisable to obtain the positive image of a photograph on a film or pellicle instead of on paper, and more particularly is this the case when the photograph is of a plan made to scale, and when it would, therefore, suffer by the paper stretching in one direction. At many establishments in Paris, and notably at the military schools at St. Cyr, many such pictures have been lately produced of very great delicacy.—LEON VIDAL in *Photo. News*.



THE SOLNHOFEN LITHO STONE QUARRY AT HUMMELBERG.

Printed by the *PHOTOPHANE Co.*, Craufield Works, Brockley, London, S.W.  
From Negative by J. Schöfle, Bradford.





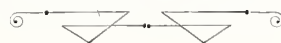
## The National Art Competition.



CERTAIN selected number of works sent in for competition from the schools of art, branch schools, science schools, and art classes in the kingdom have been now on view in the Limoges Enamels Gallery of the South Kensington

Museum. These include modelling, drawing, and painting from the living model and antique figure; painting still life in water-colours; designs for textiles, hangings, laces, and carpets; studies of historic ornament and designs; and pottery designs. The models and drawings from the nude living model are for the most part exhibited in the old iron buildings. There are in all only a few over 700 exhibits, and these, it must be remembered, are the selections out of a total of over 100,000 sent up for examination, representing 893 teaching centres. Out of the grand total there were 3,217 selected by the examiners for the National competition, and the 700 exhibits are the best of the 3,000 odd. They are, in fact, the exhibits to which medals—gold, silver, or bronze—have been awarded, and for which prizes of books have been given. There were distributed in this National competition eight gold medals, 49 silver medals, 140 bronze medals, and 340 prizes of books. In addition, honorary awards are made to students in the training class at South Kensington of four gold, 18 silver, and 49 bronze medals, and 102 book prizes, in respect of 799 works submitted by them. The examiners are gentlemen filling the highest positions in their respective branches of art, and with the prize catalogue which is issued there are bound up the reports of all the examiners, which is of the utmost importance to those interested in the progress of art as taught throughout the science and art classes of the United Kingdom. The reports deal with all the competing schools without fear or favour, and the sentences in which the opinions of the examiners are generalised should make serious reading for the students in the training school at South Kensington. This school is attended by picked students from the whole of the country; they have particularly good masters, and the very best art studies in the world are before them in the several rooms and galleries of South Kensington. In modelling from life in the round, the examiners note that "the work in this class from local schools is poor, whilst that from the training school at South Kensington is very good." In "relief from the antique" no work was good enough for an award higher than a bronze medal. Of "reliefs from the life," there is very marked improvement in the works from the training class. The works, however, from provincial and other schools are "few and of poor quality." In "heads from life," the examiners "note the great improvement which has taken place this year." The "drawing and painting from the living model" is reported as good in general quality from the National Art Training School. Of the time studies from life "the sets from the National Art Training School are below their

average, and not such as the examiners have a right to expect from the training class." Of the "drawings of the head from life," the examiners say, "The drawings of heads from the training class are decidedly poor"; and of "paintings of figures from the life," they say, "There is but a poor set of paintings in this section from the National Art Training School." The next section dealt with is "antique figure, details, &c." Here the examiners found no work to justify the giving of a gold medal, and "the examiners regret to find the works from the training class weak and wanting in solidity and vigour." In the report upon the special exhibits of the National Art Training School, there are the following observations:—"Studies of drapery in the antique figure"—the examiners observe some improvement in this class. "Studies of drapery on the living model"—the examiners regret that the drawings are not better, since the cast of the drapery in many cases is very good. The drawings are very much marred by the absence of any regard for proportion of the figure." "Painting the figure in monochrome from the antique"—the examiners . . . regret to find a falling off in the number of paintings sent up this year, and in the quality of them as compared with that displayed in previous years." "Painting of the head and draped figure"—some of the works sent up in this class from the National Art Training School reflect no credit upon the school from which they come." This is the judgment of Messrs. W. F. Yeames, R.A., F. Dicksee, R.A., and E. Crofts, A.R.A. With regard to "painting still life in water colours," the examiners awarded a bronze medal to J. W. Allison, of the National Art Training School, with the remark, "But the apples and leaves in the foreground are poor and insufficiently drawn." A book prize is given to another student, and the examiners, who are Messrs. G. D. Leslie, R.A., W. F. Yeames, R.A., and E. F. Brewstall, R.W.S., add, "The other drawings in this class from the National Art Training School are very unsatisfactory." Of exhibits "painting flowers and still life without backgrounds," the same examiners award to a female student of the National Art Training School a bronze medal "for a branch of gooseberries," but they add their "regret that the branch was not arranged as it grew, consequently the fruit does not hang as it did in nature." In the designs for cotton hangings and prints the exhibits are not so good as usual, and no gold medal has been awarded. In designs for wall-papers the examiners report, "The few designs for wallpapers from the National Art Training School were not worthy of any award." The examiners who say this are Messrs. W. Morris, Lewis F. Day, and F. Shields. A most important branch of art in its application to commercial productions is that of "pottery designs," and here the examiners report, "The designs from the training class are better than those from the provincial schools." Amongst the exhibits are many very choice specimens of the several classes into which the teaching of art enters at present; and to students the exhibition cannot fail to be of great interest.—*Standard*.



## —✧— What is Colour? —✧—



### CHAPTER III.

To study the spectrum and the many interesting and instructive byways into which it leads requires much apparatus, carefully constructed and singularly expensive. It requires the devotion of many months to even recapitulate the experiments of past philosophers and would engross half a lifetime to push the study into its furthest reaches. It is not intended to even step upon the threshold of this great world of light, but simply to traverse round about and pick up just those rays from the studio which most affect our own particular groove and throw a light or shadow on our workday lives.

In the absence of much apparatus, the spectrum can, nevertheless, be viewed by simply putting shutters to the window of a room, and allowing one small ray of daylight to enter. This ray should immediately pass in at an oblong aperture in the end of a tube having a lens at the other end, the length of the tube being the focal length of the lens. From the lens the ray should fall upon a triangular prism of glass, and the light thus broken up should be collected on a screen. There, in a long straight band, would at once be seen the spectrum of white light—not a continuous band of beautifully graduated colours, shading one into the other, but broken at intervals by somewhat strongly-marked dark lines. These lines were pointed out by Wollaston, but independently discovered by Fraunhofer, after whom they are always named. This scientist mapped out as many as 576 up to the year 1814, and since then many thousands have been discovered, the early discoveries leading up to the thorough exposition of the subject by Sir J. Herschell, Fox Talbot, and Wheatstone were fully dealt with in their papers before the British Association in 1835. It may perhaps seem a trifle invidious to put so much stress upon a lot of black lines in a paper devoted to colour, but the reader will see the necessity of this careful discrimination because it leads to a ready means of reference to almost any colour of the spectrum. Without the lines, undoubtedly the spectrum would have been scaled out for reference, but as the lines have more to answer for than mere indicators of position, it is as well to use them.

It is a common error to forget, in looking at the spectrum, that what the eye sees is by no means the whole of what is to be found in prismatic light. There are invisible rays, both beyond the violet and the red ends of the spectrum which exercise a marked effect on the world's economy. Thus the rays beyond the violet (the ultra-violet rays) together with the violet and blue, principally affect vegetation, enabling certain chemical changes to take place which are necessary for its growth and health, whilst the rays below the red (infra-red rays) are those possessing the greatest amount of energy, and if they fall upon bodies which absorb them, as very nearly all bodies do to a certain extent, they heat them. The warmth

we feel from the sunlight is principally due to the dark rays which lie below the red of the spectrum. Not only, then, is the spectrum not continuous in itself, and not totally visible to the eye, but at both its visible ends rays of light or ethereal motion exist which are unable to excite the sense of sight. This is no mere theory, for should a piece of common dyed yellow ribbon be held all along on the screen where the spectrum falls and beyond it, the red, green, and yellow of the spectrum remain almost unaltered, whilst the blue and violet appear yellow and a considerable length of yellow light is distinctly visible beyond the violet. This means of bringing the dark rays to light is not so effective as when the screen itself receives a wash of sulphite of quinine solution. The spectrum, when cast upon the treated surface, is prolonged at the violet end by additional violet rays; and ordinary machine oil similarly washed on the screen causes the appearance of ultra-violet rays, not as violet, but as a somewhat attractive green. These experiments demonstrate the phenomenon of fluorescence, which Sir G. Stokes found was caused by an alteration in the lengths of the waves of light which fell upon these foreign matters and were reflected under a changed guise. The foregoing researches only refer to the ultra-violet rays, whilst the infra-red rays can be made visible by allowing the spectrum to fall upon a surface which has been painted over with Balmain's luminous paint. The painted surface having been exposed to bright sunlight, is taken into darkness, where it gives out a peculiar violet light. The painted surface in this condition is then brought under a bright spectrum, and the ordinary visible spectrum is marked upon it. The light forming the spectrum is next shut off, and immediately it is seen that where the ultra-violet and blue fell on it, its own violet colour is more intense than before, whilst in the yellow portion it remains the same, and in the red and infra-red there is a diminution in intensity. Under different conditions, such as shutting off the spectrum immediately after it has impinged upon the painted surface, the portion affected by the red and infra-red shews increased brightness. The Balmain's paint is essentially the sulphide of calcium or Canton's phosphorous; whilst Bologna phosphorous (sulphide of barium) will give somewhat similar results.

The property of fluorescence already mentioned is remarkably illustrated by allowing the ultra-violet rays to fall on canary-glass (coloured by oxide of uranium). After such an exposure there is a faint nebulous light in the glass extending more than one-eighth of an inch into its substance.

The invisible spectrum has been made appreciable by that marvellous assistant in most researches, viz., photography. Captain Abney prepared photographic plates of such a nature that the invisible rays of the spectrum at both ends would decompose the bromide of silver and make their presence known. So powerful were these plates that they were affected by rays having wave-lengths three times as great as the red rays, and it has been found possible, by such plates, to take photographic impressions in the dark with rays coming from a black object heated only to a black heat.



Although under most circumstances the ultra-violet rays may be considered invisible, yet, by entirely shutting off the remainder of the spectrum and all other possible sources of extraneous light, these invisible ultra-violet rays have affected the eye as a lavender-grey or bluish-white. Whether this sensation is a direct one or is the result of fluorescence of the internal nervous coating of the eye is still matter for conjecture. These ultra-violet rays have been so carefully examined as to shew the presence of dark lines similar to those already mentioned as discovered by Fraunhofer.

Another feature of light is its heating qualification, and, as naturally expected, the red end of the spectrum gives the greater heat. To detect the heat a thermopile is used, in which is generated a weak electric current, and the current affects a delicately-hung needle, which points to a scale. In testing the spectrum for its heat, the needle is scarcely affected by violet, the effect begins to tell in the blue rays, gradually increasing as the red is approached and still increasing rapidly until about as far below the red as the yellow is above it, when a maximum is reached, after which the needle returns gradually to zero when far away from the visible red. This effect can be considerably increased by using rock salt prisms and lenses, and the limits of the spectrum are increased so much as to render the limits of it rather doubtful.

All these facts have an interesting bearing upon the subject of colour and lead the mind to make a number of deductions when the actual pigments are used which have the power of reflecting coloured lights.

The spectrum thus far discloses the facts that (1) white light is the resultant of a mixture of various colours and invisible rays; (2) that its component parts have different chemical effects; (3) that its components have different heating effects; (4) that its components have different effects upon the bodies on the face of the earth; (5) that whilst most of its components are visible, there are still many rays not visible, and that these invisible rays are of considerable importance; (6) that the coloured lights produced seem to depend upon the admixture of other parts of the spectrum; and (7) that the light is interrupted in parts, giving the appearance of black lines when the spectrum is formed in a long band.

Most of these facts have already received sufficient consideration, and it now remains to give a brief description of the black lines before proceeding to touch upon the admixture of coloured lights to form compound colours.

[To be continued.]



MR. J. B. MARSH'S new book, "ST. PAUL'S CROSS" (published a few months ago by Raithby, Lawrence and Co., Limited, 1 Imperial-buildings, Ludgate-circus, E.C.) has had the effect of calling public attention to the neglect of this old landmark of English religious history, and the Dean and Chapter of St. Paul's have now refined the site of the old cross and placed a stone in the centre on which is cut deeply, "Site of St. Paul's Cross."

*The Magazine of Art* for August has another good etching as its frontispiece. The picture is Zamacoi's "Kind Confessor," etched by Ch. Courty. In reviewing Mr. Onslow Ford's (A.R.A.) work, several samples of his sculpture are given, shewing his high standard. The life and work of Charles Keene are written and illustrated in this number. The work of Bernard Evans, R.I., is copiously illustrated and there is a good article on decorated ceilings. In the September number the photogravure by R. Paulussen, of "Archimedes," by Niccolo Barabino, forms the frontispiece and the leading illustration of Barabino's work, which is dealt with in a subsequent article. In it is included the attractive picture of "Columbus before the Council of Salamanca." There is an interesting article on "Copyright in Works of Fine Art," concluding with some just demands by artists and sculptors for an amendment of the present laws. In the same number is the commencement of articles and illustrations upon "Sculpture of the Year," including some fine specimens from the Royal Academy. "The Centaur," translated from the French and illustrated by Arthur Lemon, adds still more realisation of this fantastic myth.

MESSRS. FURNIVAL & CO.'S new illustrated catalogue just issued, shows the extent of the work undertaken by this important firm. The catalogue itself is a large 8vo, full red cloth, blocked in black and gold on sides and back, and occupies over one hundred pages of super-calendered paper, with the letterpress in black and inclosed in red mitred borders. The care expended on the compilation and general get-up of the book has resulted in a volume which will be of much use for reference to printers, binders, stationers, and allied traders, and will be most valued as an index to the multifarious mechanical appliances now used in the printing and kindred trades. From an inspection of its contents we gather the full range of the productions of the Reddish Ironworks, which appear to include almost every conceivable kind of machine useful in letterpress and lithographic printing, and the various requirements of the stationer and bookbinder. The firm of Messrs. Furnival & Co. are known far and wide for their enterprise in providing useful and reliable apparatus for printers, so that their new catalogue will be valuable as a standard of material and prices for the trade.

## Litho Writers' Competition.

### RESULT OF COMPETITION IN No. 5.

THE prize is awarded to MR. F. PRESCOTT, 118 Oxford-street, Old Trafford, Manchester. The prize writing appears in the present number as a supplement. The specimens sent by Mr. C. Elvidge, London; Mr. J. M. Hutchison, Birmingham; and Mr. B. Reston, Leeds, are worthy of honourable mention.

### RESULT OF COMPETITION IN No. 6.

THE prize is awarded to MR. A. S. FARRELL, 58 Park-grove, Battersea, London; Mr. R. Beck, London, making a good second.



## Printing and Kindred Trades Federation.



THIS Federation held its annual meeting at Neilson's Hotel, Glasgow, on Saturday, September 3rd, and in the absence of its president elect, Mr. C. J. Drummond,

owing to his resignation since relinquishing his position as secretary of the London Compositors' Society, Mr. H. R. Slatter, J.P., occupied the chair. The presence of Mr. Slatter was a sign of the affiliation of the Typographical Association, which was not an accomplished fact at the last conference. Since then, however, by a vote of nearly two to one, that Association had expressed its desire to federate, thus adding a most important factor to the now consolidated federation. During the twelve months, matters of most engrossing interest had occurred, and they were well discussed by the delegates. From the tone of the discussions it was clearly shewn that no society would take upon itself the heavy responsibility of invoking the aid of the federation unless it were brought down to the most dire straits, and after exercising every means in its own power to secure the objects in view. It is this honesty of purpose which secures to the federation its compactness and the sincere loyalty of its supporters.

The scheme of federation is yet comparatively young, but the ardour of the delegates present, representing over 60,000 craftsmen, indicated that it will not be long before the federated societies will know and feel their full strength by such an invaluable cohesion.

No one is more aware of the losses entailed by strikes, and no one more ready to avoid them, than trade society officials. When, therefore, a conference of trade society officials, such as this federation, meets, they inculcate those true principles of unionism which have for their objects the retention of home industry, a fair day's work for fair wages, work for all and idleness for none, work for adult men in preference to boy labour and its sequences of increased poverty or emigration of England's best craftsmen.

One of the important matters brought before the delegates was the "Irish Government contracts and fair wages to workmen." The Dublin delegates shewed that whilst a most strenuous resolution had been passed by the House of Commons on February 13th, 1891, forbidding Government contracts being given to any firm in which the "payment of such wages as are generally accepted as current in each trade for competent workmen" was not the case, yet in the Irish administration this resolution was totally ignored. Such indifference had stirred the Irish craftsmen to place the matter before their members of parliament, and they now appealed to the federation to give further emphasis to their action. The response was in accord with their desires and the conference passed the following resolution, copies of which were forwarded to members of the present Government and other influential members of the House:—

"That as the printing for Government offices and for departments directly or indirectly under the Government control is paid for with public money, and as there exists in the Queen's printing office

in Dublin an extent of boy labour entirely disproportionate to the adult labour employed therein, and as certain printing contracts of public departments in Ireland are given to firms employing non-union and boy labour exclusively, this meeting of the Printing and Kindred Trades Federation calls upon the Government to give effect to the resolution adopted by the House of Commons on February 13th, 1891, which stipulates for the employment exclusively of *competent* workmen at standard rates of wages on all Government contracts."

The accounts of the federation were duly audited and found in a satisfactory condition.

The election of Mr. H. R. Slatter, J.P., secretary of the Typographical Association, as president, and the re-election of Mr. D. Sharpe as treasurer, and Mr. Councillor G. D. Kelley as secretary, brought an animated and highly reassuring meeting to a close.

At the Trades Congress this year the eight hours question again came in for a full discussion. It is remarkable how the feeling in favour of parliamentary enactment has gradually grown stronger, so much so that it is not the principle of parliamentary *versus* independent action which receives consideration, but rather how far parliamentary enactment can be carried without doing any injury to home industries. There does not seem to be any advance made on last year's decision, and when that decision is fairly criticised there does not seem to be a fairer proposal. The idea of local trade option was crushed, and it was again decided to make the parliamentary bill general, allowing any organisation to withdraw from its provisions by a vote of its members. Such permission to withdraw, however, not being applicable to "miners."

The long-felt want of labour representation in the House of Commons again found full expression in the resolution to instruct the parliamentary committee to prepare a scheme to secure the return of independent labour candidates, whilst payment of members was agreed upon as a necessity to secure real labour representation in our legislature.

A NEW ZINC PLATE INK.—Much attention has recently been attracted to the question of litho plates as a substitute for the expensive litho stone, and Mr. F. de Brandt comes forward with an invention by which he claims that he can dispense with the necessity of having blankets on the cylinders of litho machines, and print simply by covering the cylinder with say twelve sheets of paper covered with American cloth, with an overlay similar to letterpress printing, and thus obtain what is required to be printed in relief on the printing surface by making the transfer with a special ink composed of:—

Four	parts of	antimony black.
Two	"	bone black.
Two	"	fresh resin from trees.
Two	"	strong varnish.
Two	"	Berlin blue.
Four	"	ordinary printing.

He covers the inked surface with ether and heats so as to form an enamel, and makes the portions to be printed in relief, from which any number of copies may be printed, by having the cylinder covered as above described.

# The Amalgamated Society of Lithographic Printers of Great Britain and Ireland.

MEETING OF THE GENERAL COUNCIL, LONDON, JUNE, 1892.



HIS year the lithographic printers held their triennial meeting of the General Council in London, on June 6th and five following days. Mr. J. B. Aves, of London, was elected chairman, and Mr. W. Smith, of Dublin, vice-chairman of the council. The council consists

sittings to a close without coming to some most important decisions. Matters of leading importance came before them for discussion, and they finally made such new arrangements in their organisation as to prevent the recurrence of such strikes as they have experienced in the early part of this year in Yorkshire.



WM. T. MASON, LEEDS.	WM. H. HAMMOND, BIRMINGHAM.	SAMUEL SPENCE, BELFAST.	ROBERT PATERSON, DUNDEE.	THOS. SPROAT, GLASGOW.
BENJ. NEAL, LIVERPOOL.	ENOCH STEVENSON, NOTTINGHAM.	JOHN B. AVES, LONDON.	GEO. D. KELLEY, <i>Gen. Sec.</i> , MANCHESTER.	WM. SMITH, DUBLIN.
	FREDK. MONTY, NEWCASTLE-ON-TYNE.		JOSEPH BERRISFORD, MANCHESTER.	ALEX. MACDONALD, BRADFORD.
				PETER MUIRHEAD, EDINBURGH.

of fourteen representatives, including the general secretary, Mr. Councillor G. D. Kelley, from all the large centres of printing, and their deliberations, as usual, turned upon a vast accumulation of suggested alterations in the rules and matters of more or less moment. Recent events gave the council food for serious consideration, and they did not bring their

THE August *Portfolio* contains a fine photogravure of "Wurzburg," by Mr. S. Prout, and two fine etchings, the one by Mr. C. O. Murray of "Over the Border" being good. In the September *Portfolio* is an etching by Mr. D. Y. Cameron, from a stretch of Clyde scenery. It is a very effective production and full of vigour.





## Facts about the Full Zinc Plates.



NOTWITHSTANDING the amount of explanations given with respect to these plates, it is extraordinary to still find a number of apparent difficulties cropping up, and

mainly due to a want of confidence and a want

of ordinary tact. Further discoveries have been made, and many printers have had marked success by methods peculiarly their own. Amongst the more recent disclosures there are some of considerable value, and it is here intended to set forth the new items in a tabulated form for ready reference.

### TRANSFERS TO PLATES.

The ink for copper-plate transfers must be a good sound ink. Not of a soft nature, but just containing sufficient wax to allow it to readily melt into the engraving. With such an ink a larger amount can be left in the engraving if it be allowed to cool a little before cleaning and pulling the transfer. Zinc plates require that a good body of transfer ink should be put down upon them.

The same remarks as to fulness and hardness of ink apply to stone transfers. Some printers use a powerful ink, which contains much grease, and cannot be piled on transfers the same as a harder and less greasy ink can be. The harder ink, although much fuller, will give a sharper result on zinc plates than a soft greasy ink.

Fine manuscript from the litho writer can be transferred direct to plate.

Chalked paper work can be transferred direct. If in doubt, the work can be put to stone, and an original kept by transferring to plate. Some excellent examples of the latter exist, which have all the highest qualities of the original chalking.

Grained stone work can be transferred to plates with equal success. There is an instance in which the drawing was done on plate, but it failed from some unaccountable reason, and the same drawing was afterwards transferred from the stone to the plate as an original, resulting in a great success.

In the process of transferring some printers differ. As a rule a dry transfer can be put down to a damp plate. The transfer need not be damped, nor the plate either dry or warmed by heating the stone underneath. In any case there need be no loss of time, after transferring, in stripping off the paper, washing, gumming, and proceeding to rub or roll up. There is, however, a most successful way of insuring a perfect transfer. When the paper, etc., are washed off, it should be gummed up and dried. The ink of the transfer should be washed out with turpentine on the dry gum, and the whole surface covered with lithophile. When

dry, it can be washed with water and the inking up proceeded with. An exception to the general treatment in transferring is to leave the zinc plate standing without gum for one or two hours after the transfer has been put on. Printers will naturally say, this cannot be done; but it is done, and by working a number of orders consecutively the same thing could be done almost anywhere, resulting in good firm transfers.

One point in connection with transfers cannot be too strongly emphasised. In a small Lancashire town some excellent copper-plate transfers are put down to plate and printed from them. But one of the main reasons for this is that instead of scamping the transfer pulling, each transfer is seen to contain ink where it is required to go down to stone. What is not on the paper cannot go down to the plate. This was strongly illustrated at a north country office, where some large solids had failed to go down solid on the zinc plates, and it was to some extent attributed to the zinc plates not being able to take solids. Fortunately the printer was then patching up a number of transfers with somewhat similar solids, and it was easily seen that these were not anything like solid on the transfers. These would be put to stone, and a lot of repairing required, for what is not on the paper cannot go down to the stone. But what was considered a fault in the zinc plate would be overlooked in the stone, and the printer might casually remark, "Oh! it's gone down a bit rotten, and will want a bit of touching up." It is just the same with zinc plates.

### DRAWING ON PLATE.

In drawing upon zinc plates, very little can be added to that knowledge of lithographic drawing which is the common property of all draughtsmen; the only feature which has received good testimony is the accuracy with which the stippler can work upon them as compared with stone. On stone the ink frequently runs from the pen unawares, forming larger dots than requisite, or filling up two or three adjacent dots, and necessitating scraping. With plates this seldom, if ever, occurs; for the absorbent nature of the zinc plate absorbs all superfluous moisture, and leaves a stipple dot as it is drawn.

### TRANSPPOSITIONS—BLACK TO WHITE.

The method of gumming out on stone and afterwards washing in with writing ink, or rolling up in transfer ink, is equally applicable to plates. But one of the smartest ways of gumming out is to use a well-mixed solution of gum and Indian ink, instead of gum and vermilion or gum and blue. The transpositions thus effected have a sharpness equal to copper-plate engraving, and by many would be actually considered as copper-plate transfers. A method which has not yet found its way into general use, is to mix silicate of soda with either writing ink or copper-plate ink. Drawings or transfers made with this ink give the finest transpositions ever produced.

Zinc-plate work can be manipulated in just the same way as stone work, with subsequent transfers from ruled, grained, or dotted plates; and as with all other work produced upon zinc plates, there is a cleanness and fineness seldom equalled by stone work.



## OFF-SETS.

Although off-sets can be well put down on zinc plates from bright enamelled paper, yet a much finer way is to use a non-surfaced paper, such as light-brown glazed wrapper or steel-blue paper. Off-sets to plate from these latter are excellent, and whilst not giving any quantity of easily-rubbed dust on the lines, they give a sharpness never excelled by stone.

## PREPARING PLATES FOR PROVING.

In all cases where grained plates have been chalked upon, the work must be carefully etched with a solution of one pint of gum and a dessertspoonful of concentrated phosphoric acid, before it is rolled up, in exactly the same way, and with the same purpose in view, as when etching grained stones with nitric acid and gum solution.

To get the best results with zinc plates it is advisable that the printer should always purchase the phosphoric and acetic acids from the same maker, in their strongest and chemically pure (not commercially pure) condition—viz., as concentrated phosphoric acid and glacial acetic acid. With these acids any strength can be obtained by dilution.

Some printers have proved that zinc plates do not require the use of nut-gall decoction at all, and have achieved signal success by using a solution of one pint of pure gum arabic with a tablespoonful of concentrated phosphoric acid to replace the ordinary dilute solution of nitric acid and water always used for stone work. With this single etcher the work is treated in gumming, rolling up, and etching, exactly as for stone. This etcher is rather powerful, and is effective in keeping down the scum.

Again, when a plate has lost its tone and goes dark in hue, with a tendency to scum, a weak solution of the glacial acetic acid washed carefully over it will revive the tone and kill the tendency to scum.

At an early stage in proving, and always in printing, a weak solution of tea should be used, instead of clean water, for damping. The highly commendable practice of having ten minutes or a quarter of an hour in the afternoon for tea time, will always keep a good supply of tea solution ready for zinc-plate work. The spent leaves can be boiled in water for this purpose, and no extra cost incurred as in purchasing sour beer for stone work.

If any printer still considers the use of nut-gall decoction better than phosphoric acid and gum, then it can be prepared by steeping four ounces of gall nuts in three quarts of water for twenty-four hours. This is well boiled after steeping, and finally strained.

Nut-gall decoction thus prepared ...	$\frac{3}{4}$ -pint.
Gum (ordinary thickness, with one drop of carbolic acid in it) ...	$\frac{1}{4}$ -pint.
Concentrated phosphoric acid ...	$\frac{1}{4}$ -ounce.

Many printers have found that the etching solution purchased from the plate makers goes very thick by the formation of a fungus (mould) upon its surface. They can prevent this by adding one or two drops of carbolic acid to the pint of etching solution as soon as opening it.

The final cleaning up of a plate has caused many printers a vast deal of trouble, but that is all at an end; it is as simple as stone work.

The practice of erasing with charcoal is a mistaken one, for it simply burnishes the plate and ultimately takes ink. The proper method is to touch the dirt on the plate with a pointed stick (acid stump) dipped into either the etcher prepared from one pint of gum and one tablespoonful of concentrated phosphoric acid, or the new strong No. 1 solution supplied by the zinc-plate makers. As with stone work, the printer will have a sponge ready to wipe off either solution if it spreads out dangerously near the work.

The final touches for cleaning up a plate may be done with a very sharp knife. In fact, with such a knife whole surfaces may be scraped off with proper dexterity.

If any dirt on the plate, or its edges, should not readily disappear with using the acid stump, as shewn above, it simply needs washing off with turpentine, and then touching with the stump to finally remove it.

Much of the difficulty in cleaning up is avoided by using lithophile before the first rolling up, and transfers which are apparently weak can be considerably strengthened by the use of the same material. The same treatment applies to work worn out, whether on stone or zinc plate.

## MACHINING FROM ZINC PLATES.

Scarcely any part of the process of zinc-plate printing has been so studiously avoided as machining from the plates. Certain mechanical difficulties, as well as chemical difficulties, have arisen, and have caused a revolt against such printing. Many firms are most successfully using the plates in the machines, and there is apparently nothing necessary to secure the best results more than the ordinary care bestowed on stone. When a stone begins to scum over, a printer immediately proceeds to rectify it. But with the plates being darker the scum is not so soon detected, and gets a good hold before any attempt is made to remedy it. The printer must, therefore, use the weak tea solution for damping from the first run onwards, and the scum will never appear.

In a small town in Lancashire some of the finest commercial work is printed entirely from plates. The plates are put by for repeat orders, and have frequently been printed from in the course of a year. Those plates never scum over, nor do the edges get dirty, simply because tea solution is used. Again, the time which may apparently be lost at the first setting of a plate on a plate bed, is first of all largely counter-balanced by the great difference in the cost between the plate and a stone, and secondly in all subsequent reprints. The labour alone saved is a great compensation, and a plate once fitted to a bed always drops back into its place in subsequent use.

The edges of plates can be kept clean, not by using any acid solution, but by using the tea solution or a weak solution of caustic soda.

Scumming is largely prevented by the use of a well-mixed ink. It is impossible to prevent using tints largely composed of varnish, and the only precaution

to prevent scumming is to use tea solution in damping. If scum should, however, accumulate, it is readily removed by using the concentrated phosphoric acid etcher already referred to, or by washing over with a weak solution of the glacial acetic acid. The latter not only removes scum, but revives the plate, and assists thereby in the more ready detection of scum afterwards.

A large showbill—30×40-in.—is before us which has been printed in nine or ten colours from plain and grained zinc plates, and in it not a sign can be found of scumming, or loss of colour or stretching. This print alone dispels any suggestion as to the stretching of the plates, for the whole of it is in perfect register, and constitutes one of the finest prints that can be produced. Another example is a small coloured print from a water-colour sketch, shewing not a single defect. Another example is printed from large chalk transfers, and contains all the merit of the original drawings. Another example is from a noted firm of map printers, in which the black is printed in every way equal to a copper-plate print. Another example is a large zinc plate full of tag tickets, the plate after 10,000 runs being in every way equal to a new transfer, and the whole plate being free from the slightest scum.

Every class of work can be seen printed from zinc plates, from the 60×40-in. poster in colours, on the hoardings of Manchester, down to the finest commercial and bank-cheque work.

A species of printing which always has its trying points, is the bills of quantities which are sent in over-night, and must be all out by morning. A large firm in Liverpool frequently has this sort of thing to do, and were it not for always keeping a good stock of large zinc plates, it would be practically impossible to meet some of these extensive demands. Printers cannot overlook the value of zinc plates in cases of emergency. Many a time employers are put to considerable expense in purchasing stones for one special order, because the necessary stones they have are "locked up" at the time. If they kept a good stock of zinc plates, the emergency would be met at one-third to one-fifth the cost they incur in stones, as well as saving the space occupied by the new stones; and space is a commodity in most printing houses which is not over-plentiful.

In printing from plates, the ordinary machine rollers—glazed or nap—are perfectly suitable; and the ink must be kept just soft enough to feed the work properly. It is a fact that work on zinc plates requires very nicely feeding to retain the full power of the work, but that is a matter every printer has to contend with in all printing.

In printing from zinc plates, it is naturally thought that the special beds are a necessity. It is certain that with the new beds the plates can be very nicely adjusted, but there are firms who have printed from unprepared zinc for years who have never used iron beds. They simply fasten the plates over a stone. The gripper edge is carried down the side of the stone, and fastened in with the same blocks that are used to fasten the stone. The plate may then be fastened in the same way at the back edge, by allowing the plate and stone to pass under the

cylinder and thus flatten it out before fastening. The back edge should be fastened whilst the full pressure of the cylinder is on the plate and stone. But these firms have also proved that it is not necessary to fasten the back edge at all. So long as the gripper edge is secure, the back edge simply requires bending down, and in printing it will pass under the dampers, cylinder, etc., in its forward direction without rising or catching, and in the printing of an impression the plate is flattened out perfectly without crease or fold. The method of fastening has been still more simplified by placing the zinc plate on a stone which has been securely fastened; the gripper edge of the zinc is then nailed by a few strong tacks to the wood blocks used to fasten the stone in its position in the carriage. The back edge is bent down as before, and printing proceeded with.

#### ALTERATIONS ON ZINC PLATES.

The old system of making alterations by the use of the No. 1 and No. 2 solutions, followed by the coating composition, has been greatly simplified. The No. 1 solution has been manufactured stronger, and after the work has been well washed out with turpentine, the application of No. 1 solution (strong) entirely eradicates the work. The zinc plate then requires a wash of dilute acetic acid to make it ready for the alteration. In some instances the work can be rubbed off the plate with india-rubber or ink-eraser. The surface is then re-prepared with a wash of the alum and acetic acid solution used in most litho establishments. The solutions can be applied with a pointed stick, so that the smallest alteration can be effected. It is certain that many printers have failed in even these simple operations, because they omit to leave the No. 1 solution on the plate long enough to get the old work out. If possible, it should be washed out first with benzine, and finally with No. 1 solution; then a wash with dilute acetic acid. The foregoing shews that No. 2 solution and the coating composition have been discarded.

#### RE-PREPARED PLATES.

From the above details it may be surmised that the re-preparing is also simplified, and it certainly is. The work must be well washed out with turpentine or benzine; then covered with the strong No. 1 solution. This must be thoroughly washed off before proceeding to prepare the plate with dilute acetic acid. Some printers have found that a solution of caustic soda in water, with a little hydrochloric acid, is also very effective in place of No. 1 solution.

If the old book method of re-preparing is followed, then the No. 2 solution must be greatly diluted, and when the coating composition has been put on it must be allowed to dry thoroughly. This coating composition lies very streaky, and before use it must be well brushed with a hard bristle brush, or well washed, to remove all the dust. Work of considerable value has been spoiled by omitting to brush or wash, an omission which would not be countenanced in ordinary stone work. Neither artists nor printers think of putting work on a stone without giving the stone a good rub over with paper or a clean cloth.





A LIFE STUDY.





## PRESERVATION OF PLATES.

Much good work is lost by careless preservation. The lithographer is fairly careful of stones, but the zinc plate is treated rather too much off-hand.

The work must be washed out, and rolled up in a good retransfer ink; ordinary black is too hard in drying. To keep the ink soft it must be kept free from air. The most effectual means is to gum it up nicely with pure gum arabic and a drop of carbolic acid. When the gum is dry, tallow or mutton fat may be rubbed all over the face of the gum. With such a facing, oxidation is practically impossible. More ready methods are to put a sheet of paper, wet with good gum, all over the face of the plate, or to gum up only. The face of the plate having been looked after, the zinc itself must be preserved. Several printers roll the backs of the plates all over with black ink, and in putting them away, put papers between to prevent the ink setting off. Others bore a hole in the corner of the plate, and hang them all on hooks or straight wires driven in the wall. Many plates can be put on one wire. So long as the plates are kept comparatively dry the latter method is quite successful, and we have seen a large number of plates in use in Leicester, from which transfers have been taken lately, that have been hung on these wires from four to five years. Zinc plates can be kept in wrappers the same as copper plates. They should be kept in wooden boxes or cupboards, in preference to being put against brick or stone walls.

When plates are wanted after having been put away, they should readily roll up alright, if put away in a soft transfer ink or a good preserving ink. But in case this precaution has not been taken, then the paper should be washed off and the plate re-gummed. The gum having dried, the work should be well washed out, if possible, with turpentine. Then wash over with lithophile. The work should then roll up good, after cleaning the gum off. If not, then the other stone methods should be applied.

## MISCELLANEOUS REMARKS.

Occasionally, in the preparation of zinc plates, there seems to be some defect in the chemical treatment. This is very rare, and printers who have used the plates for any length of time can almost tell by inspection whether the plate is defective. To prevent defects, the plates should be well brushed over, or washed with a dilute solution of acetic acid.

Many printers, whose space is limited, or whose business is very extensive, have seen the enormous value of zinc plates in relieving the machine stones which are so frequently put away with costly originals on.

The coating composition manufactured for the Hull zinc plates has a use for other purposes. Printers who prepare their own zinc blocks for the letterpress machine have found considerable difficulty in transferring the work to the zinc. This has been entirely overcome by treating the zinc with a wash of the coating composition. By this means, lithographic drawings can be readily converted into type blocks.



## Trade Reports.

(From our Special Correspondents.)

## DERBY.

**L**ITHO trade here is very quiet, but the collographic branch of Bemrose & Sons (Ltd.) continues busy. No society men have been unemployed during the last two months, though short time has been worked in some places.

By the generosity of Messrs. Bemrose & Sons (Ltd.) the employés had their annual excursion on Saturday, August 6th, Scarborough being the place selected. The firm presented each person in their employ with a railway ticket, in addition to allowing the day's wages. A small programme, describing the various places of interest and the easiest way of finding them, was issued by the firm, and proved very useful. Two special trains were provided by the Midland Railway Company for the conveyance of the trippers. Special facilities were granted for a week's stay, of which a number availed themselves. The weather was all that could be desired, and all thoroughly enjoyed themselves, either by sea bathing, boating, driving, donkey riding, or at the various places of interest in the town. The return journey was safely accomplished, and hearty thanks were expressed to the firm for this further proof of their goodwill.

THE Derby Trades Council, on the motion of Mr. Mawbey (printer) have decided to issue a monthly journal for the propagation of trades unionist principles. Mr. Mawbey further proposed a scheme for the erection of a trades hall in Derby, and dwelt upon the advantages it would possess in centralising the trades union spirit, and finding permanent offices for the secretary. He suggested that it should be built in the centre of the town, and made proposals, the adoption of which he thought would enable them to procure the necessary funds, and make it a paying concern. A vote of thanks was passed to Mr. Mawbey for laying the scheme before the council, and the delegates were advised to bring the proposals before their societies.

GLAD to say the last number of the B.L. was favourably spoken of by subscribers. The title-page produced by yourselves being much admired.—W. C.

## GLASGOW.

THE first annual excursion of the employés of Messrs. Spowart & Ralston, lithographers, Glasgow, took place on Saturday, September 17th, to the picturesque village of Fairlie, situated on the Clyde. The weather being all that could be desired, games and dancing were indulged in throughout the forenoon in the beautiful Fairlie Glen. The company then sat down to a sumptuous dinner provided by the firm. Races were got up for the young people and a number of prizes awarded. In the afternoon tea was provided, and the remainder of the time was taken up with songs and complimentary addresses. Before leaving, a vote of thanks was awarded to Messrs. Spowart & Ralston for their kindness and liberality.

**MAIDSTONE.**

ON Saturday, September 10th, a number of the employes of Messrs. Hobbs & Sons, Maidstone, celebrated the completion of the apprenticeship of Mr. Searles by an outing by road to Tonbridge. Dinner was partaken of at the Bull Hotel, and subsequently a smoking concert was held, under the genial presidency of Mr. Jupe. During the intervals the toast of "The Trade" was given in a neat speech by Mr. J. T. Hibbert, sen., and that of "The Guest, Mr. Searles," by the chairman. In the name of all present he wished him a happy and prosperous future. The toast was acknowledged in feeling terms by Mr. Searles. A well-arranged programme of excellent music concluded the gathering.

**LEICESTER.**

By some unaccountable error two names—those of F. J. Swift, artist, and James Hunt, lithographic apprentice—were omitted from the pass list of the Leicester class given in our last issue. Both took second-class certificates. This addition makes twenty-four passes, instead of twenty-two, out of twenty-seven who sat. Mr. S. D. Hall opens the new class at the Ellis Technical School on Wednesday October 5th, and there is every prospect of a large attendance, the interest in the class, consequent on the successes of last session, being considerably increased amongst both the employers and the employes of this rapidly growing centre of industry.

THE litho trade is somewhat quiet in Leicester, one or two firms working short time. Three artists are already employed at the new litho department of the De Montfort Press, in King-street, though all the machinery is not yet in place ready for working.

**LIVERPOOL.**

ON Saturday, September 17th, the artists and litho printers of Messrs. Blake & Mackenzie, Liverpool, had their annual outing. The company, numbering forty, left the works shortly after one o'clock and proceeded by way of West Derby, Knotty Ash, and Broadgreen to Gateacre, arriving at the Bridge Inn about four o'clock. The beautifully fine weather, combined with the splendid arrangements for the comfort of each individual, rendered the fifteen mile drive most enjoyable. The tea provided by mine host Mr. Poole, and served in the pavilion, was really excellent. After tea various games were gone through in a spirited manner, the fine bowling green being also well patronised. The company again assembled in the pavilion, and after an excellent musical programme had been gone through, started on their return journey, arriving home about ten p.m. Much credit is due to Messrs. Whale and Edwards, the veteran committeemen, who have an established reputation for attending to the welfare of their fellow-workmen in connection with these pleasant annual outings.

**KIRKCALDY.**

THE lithographic and letterpress printing business carried on by the late Archibald Beveridge has been disposed of by the trustee to Messrs. Couper & Allen, who will continue it in all its branches. The business was commenced fully twenty-five years ago by the late Mr. Beveridge, who began in a very humble way

and gradually built it up to be one of the largest lithographic establishments in the north of Scotland. The firm has always been known for its excellent class of colour work, a speciality being floorcloth and linoleum patterns—facsimiles of the cloths. The practical management will be left with Mr. Allen, who, having been brought up in the works, is thoroughly conversant with the details of the trade.

**Answers to Correspondents.**

**S**UBSCRIBER asks for advice on reversing a job—white letters on dark ground—and we recommend the following method of procedure:—Roll up well and protect by resin, etch with nitric acid till it stands in relief, allowing for thickness of resinous coating. Wash ink, etc., off with turpentine, and wash the whole stone quite clean with water, using clear water with about one per cent. of acid for the final wash. The stone must be *absolutely clean* before putting the litho ink on. When the stone is dry, cover the work to the extent desired for ground with litho writing ink, let it dry, and roll up with printing ink. The work and ground now being equally black, the ink has to be removed from the parts in relief, so that they are reversed from black to white. Take a long piece of flat snake-stone and polish away the surface of the raised portion until the design becomes quite clear. Gum the stone, dry, and roll up. The polishing should be continued till the stone is nearly level again.

SINCE the sheet containing the solutions to the Examination Questions went to press, we have received the following answer to Question XII, and we give it as another and shorter method of solving the question.

**QUESTION XII.**—Suppose a plan has a border line  $14 \times 10$ , what will be the measurement of each side when the plan is reduced to one-half its size (area)? Show how you arrive at the result? By *Euclid*, Book VI.

"Similar figures are to each other in duplicate ratio of their homologous sides."

$$\begin{array}{l} \text{Area of fig. } 14 \times 10 = 140 \quad \text{Call long side of smaller fig. } x \\ \text{" " " half-size} = 70 \quad \text{" then by Euclid, Book VI.} \\ 140 : 70 :: 196 \text{ (i.e. } 14^2) : x^2 \\ x^2 \text{ works out } 98 \\ x = \sqrt{98} = \sqrt{49 \times 2} = 7\sqrt{2} \\ 7\sqrt{2} = 7 \times 1.4142136 \end{array}$$

$$\begin{array}{l} \text{Similarly for short side } 140 : 70 :: 10^2 : y^2 \\ \text{when } y \text{ works out } 5\sqrt{2} \text{ or} \\ 7.071068 \end{array}$$

$$\text{Proof, } 7\sqrt{2} \times 5\sqrt{2} = 7 \times 5 \times 2 = 70 \text{ half area.}$$

**HALF-A-CROWN REWARD** will be given for the present address of Mr. W. Jones, late Secretary of Birmingham Branch, Litho Printers' Society.—**RAITHBY, LAWRENCE & CO., LTD.,** De Montfort Press, Leicester.

**LITHOGRAPHY AND STATIONERY.**—Advertiser, aged 27, seeks situation as manager. Thoroughly understands the trade and is fully competent in making out estimates.—Address: "LONSDALE," B.L. office, Leicester.

**LITHO ARTIST** wants situation as Improver.—"NEMO," BRITISH LITHOGRAPHER office, Leicester.



## Specimens.

[Will our friends kindly remember to send their specimens either TIGHTLY ROLLED or FLAT BETWEEN BOARDS; the cost is but a trifle more, and for review they gain in being presented as they came from the machine. If sent unprotected, specimens are usually so crushed and disfigured as to be utterly unfit for criticism or preservation.]



FROM MR. ALFRED FOX, Windsor, comes a fine specimen of work in the shape of an illuminated address,  $19 \times 15$  inches, neatly framed in plain gilt moulding. While partaking of the conventional style which seems to cling to this class of subject, the whole design is most artistic and attractive, carefully finished in details, and unusually tasteful in colouring and general treatment. An artistically arranged head and side panel with floriated coloured design on appropriate toned ground, and including two very effective coats-of-arms, is nicely treated in harmonious colours, gold being used with good effect throughout. Two small views of Windsor are fittingly inserted, the one in the lower right-hand corner—depicting Windsor Castle—being an especially dainty specimen of colouring. The lettering is carefully and boldly outlined and the colours are, as a rule, applied with tasteful effect. We understand the specimen is an average production of the work of Mr. Fox, and we must congratulate him on the care and extreme good taste displayed.

WE are in receipt of a couple of brilliantly executed chromo calendars for '93 from Messrs. Blake and Mackenzie, the well-known horticultural printers, of Liverpool. The designs are both  $15 \times 10\frac{1}{2}$  inches in size, the subjects floral, admirably grouped, and printed on a solid gold background; one—roses, in a border of ivy leaf, very natural in treatment, the other in a narrow border in imitation of plush. The calendars are disposed in neat panels at the bottom of each design, in such a way as to be easily seen without detracting from the beauty of the pictures. Artistic floral subjects are not too plentiful in chromo calendars, and these handsome specimens of Messrs. Blake & Mackenzie's will no doubt be popular.

CHROMO CARD CALENDARS have begun to arrive early from the Continent. The first—a quarto for the well-known Stuttgart dry goods house of Herr F. Thoma—is a very attractive and appropriate emblematic design, showing a classic figure of "Beauty" on one side, and on the other piles of coloured stuffs; at the foot of the design is a pretty view of a garden with fountain, etc., the rest of the ornament being in the rococo style. The grouping is tasteful and natural, the colouring bright and effective, and the printing excellent.

A CIRCULAR and business card, the latter in the free and fresh American style, of which Messrs. Campbell, Marsden & Co., 18 Lawrence-lane, Cheapside, E.C., make a speciality, are excellent examples of tasteful and well-finished work.

THE business card of Mr. J. Moore (late Moore and Hayes), Birmingham, is a good example of illuminated work, though somewhat stiff and formal in design. The technical execution is well up to the mark.

THE business card of Messrs. Strecker & Moser, Stuttgart, is a handsome design, showing the craft emblem supported by a strongly drawn, full length figure emblematic of the arts, in a rococo border, very natural in treatment and admirably worked out in colours and gold, a second craft emblem being embossed in relief in the lower right hand corner of the design, a plain gold line enclosing the whole. The design is by the well-known artist, P. Schnorr, and is excellently produced in every way.

A PARCEL of litho specimens from Messrs. Foster and Bird, King's Lynn (forwarded by Mr. W. Gardner, who is responsible for their execution), including bazaar posters, chalk portraits, presentation certificates, and sheets of labels in monochrome and colours, shows excellent work both in the artistic and printing departments. The chalk work is specially good and very effective, whilst the register throughout all the sheets is remarkably exact, and the printing clear and solid.

SOME neat specimens of commercial work from Whitcomb & Tombs, Limited, Christchurch, New Zealand, are excellently done. The design of their own business circular, in panels and medallions, in a shaded background, is very effective; and the lettering as well as the script writing in the body of the job is remarkably sharp, clear, and regular in lining, the printing being of equally good quality. Better work of its kind could not be wished for.

MR. CHARLES SPENCER, Auckland, New Zealand, sends us some remarkably fine specimens of collotype printing, executed from photos taken by himself. They comprise figure subjects, landscapes, rural and urban scenery, and public and business buildings, and a few plates of shells. In artistic effect, depth of tone, and clearness of detail, Mr. Spencer's work is fully equal to similar work done in Europe. We shall be pleased to see more of it.

AN attractive showbill for his own business from Mr. C. H. Johnson, Corn Exchange Works, Leeds, is both effective in grouping and colouring, and excellently printed. The lettering is specially clear and readable, and the views of the different departments naturally treated. A gold medallion on the left-hand side of the design records the fact that the business was "Established in the Reign of George III."

A PRETTY specimen of chromo work from Herr F. Wagner, Zurich, measures  $12 \times 15$  inches, and shows a dainty arrangement of flowers on buff tint in the shape of a cross, the corners of the sheet being left white, and the centre of the design occupied by a view of a Swiss ch  let, with snow-clad mountains in the background. The execution, in nine printings, is all that could be desired.

A VERY effective business card is that of Messrs. Spowart & Ralston, lithographers, Howard-street, Glasgow, printed direct from plate in black on white surface card. The lettering is in excellent contrast with the shaded-lined background and foliage ornamentation running through the design.

A SPECIMEN of chalk portrait work done by Mr. E. King, of Trowbridge, Wilts, is excellent in tone and texture, and capitally printed.

## Notes and Queries.

*[Through this channel anyone submitting a question upon printing or allied processes can receive an answer, either from our staff of practical technical writers secured for this Journal, or from some reader who may be better qualified to answer "special" questions.]*

**I**N reply to Mr. P. D. Quinn, of Belfast, it is a fairly easy matter to give you enough information to prevent a repetition of your difficulty. In your query you say that the yellow was made with tint varnish, machine oil, and a little strong varnish. Now, both the amount and strength of the varnish used were too great; there should have been more of the softening material in it, viz., machine oil, soft soap, colza oil, paraffin, petroleum, mineral candle, tallow, Fleming's or Trochard's solid oil, oil of cloves, etc. The yellow, which is a lead compound, is a very strong drier, and must be kept soft. By adding any of the above, especially Trochard's oil, a softness would have been given which would have allowed the varnish and oil used to sink into the paper and leave only the pigment on the surface. The paper, too, was not absorbent enough for the amount of varnish used, for it was proved when you printed it on a good surface paper that the paper had sufficient absorbent power to take it all in and not leave it glossy. The gloss arose from the hardening of the ink upon the surface, instead of sinking as it should have done if you had softened it with a sufficient quantity of any of the oils named.

Now, however, that the yellow is printed, you can still get over the difficulty. You have already found that where the flesh tint overlies the yellow that the blue will print on top. To obtain this result all over you must therefore put a stone in the machine and roll it solid with a clear, soft, uncoloured varnish, and print this softening varnish all over the sheet. After that the blue will print anywhere. Some readers may think that this is a wasteful theory only, but we can assure them that when large quantities of paper are at stake this course is pursued, with just this extra amount of labour, that each sheet is dusted all over with French chalk (talc) before the softening varnish is printed on. We should recommend you to always determine beforehand the chemical composition of your pigment, and if you find it to be a lead or manganese compound, or an ochre, be very careful not to omit some softening material when making it into a machine ink.

**I**N reply to "Patent," we are of opinion that no one has the least right to take out a patent for embossing from lithographic stones, either in the machine or press. The principle of embossing is already well looked after, and has been applied to plates and stones. Grained stones—either sanded, bitten, or worked out in pattern—have been used for embossing for many years, and the practice has been further improved by packing on the cylinder so as to make it in a rudimentary manner a die, fitting into the stone matrix. The idea of patenting such a method is on a par with patenting a method of pulling copperplate transfers in a litho press, or using a litho press without tympan for punching labels.

**MR. JOHNS**, of Newport, raises questions upon the treatment of hand-press and machine rollers. He points out the various processes which have from time to time appeared in print, and asks which can be considered the best for preparing a new roller. The course which recommends itself is to rub the new skin with prepared lard (free from salt, and obtainable at all chemists). The lard should be rubbed in before a fire, and it will soak into the skin and assist in keeping it elastic. The lard will apparently be all absorbed in a few hours; it is then time to rub more lard in. If it again appears dry in an hour or two rub more lard in. When the skin will not absorb more lard, it can rest awhile before commencing to roll up in medium varnish. This rolling must be continued at intervals of two or three hours for three days. By that time the dirt will have been pulled out of the skin, and the nap or grain brought out to its fullest extent. The roller is now very greasy, and should be well washed with turpentine and scraped. After scraping it can be again well washed with turpentine, the latter being allowed to evaporate before rolling up in black or coloured ink. Should the roller retain too much grease, it can be scraped and well covered with turpentine. The turpentine can be ignited and allowed to burn out. This burning often improves the nap and gets rid of superfluous grease. Handpress rollers and machine rollers should be well cleaned and smeared over with tallow or prepared lard before putting them away. When required, a good scraping and washing will cleanse the skin from grease.


**MR. WIDDOP**, of Bradford, Yorks, has favoured us with some excellent examples of photo-mechanical work produced from dry-plate photographs. He has executed and printed the photographs himself by the ordinary "amateur" methods, and the prints certainly exhibit a first-rate knowledge of the subject. No. 3, the photo-litho from a pen and ink drawing, is as good as can be required. No. 2, the collotype, is in every way perfect if it will stand prints being pulled much heavier than the sample. No. 1, the two specimens of half-tone lithography, is certainly a very near approach to the fine granulation of collotype. There is a slight tendency for the surface to become patchy, but that should be improved with due care. If the photographs were taken from the real objects, then the process has attained a stage of marked perfection. It is impossible to judge how such exceedingly fine granulation will stand transferring or machining. If, after transferring, it is treated with lithophile and finally well etched, there seems no reason to doubt that it would be a success, and far and away superior to any previous process of half-tone lithography.

**I**N reply to "Francis," of London, we are not in possession of any information respecting a solution which can be applied to the rollers of a rolling machine to prevent the setting-off of newly printed work. It seems possible, however, that if they were occasionally rubbed over with French chalk, the difficulty would be obviated.

**I**N reply to Mr. D. Fox, it is plain that in rolling up you omitted to keep the stone damp enough.



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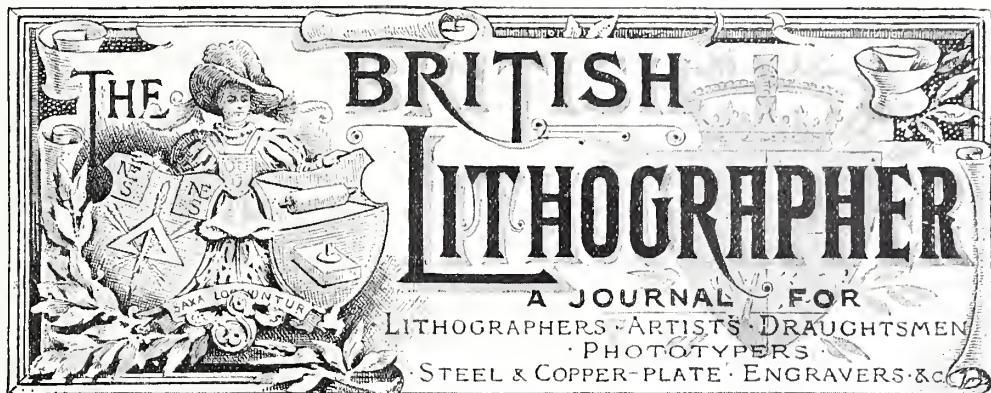
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A JOURNAL FOR  
LITHOGRAPHERS · ARTISTS · DRAUGHTSMEN  
· PHOTOTYPERS  
STEEL & COPPER-PLATE · ENGRAVERS &c.

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## OUR SUPPLEMENTS

IN this issue are, with the exception of the handsome design inserted by Messrs. McCaw, Stevenson and Orr, entirely produced in our own lithographic works. In organising this new branch, we have not in the past three months been exactly on a bed of roses—many difficulties had to be overcome, not the least being new and untried machinery and a staff not fully settled down to working with each other to the best advantage; but we think that for "first efforts" the chromo specimens—for Messrs. Mander Brothers and A. B. Fleming & Co., Ltd.—will compare favourably with anything that has yet appeared in the B.L. Now we are fairly at work, we mean to satisfy both artists and printers if they will have patience.

## "UNFAIR."

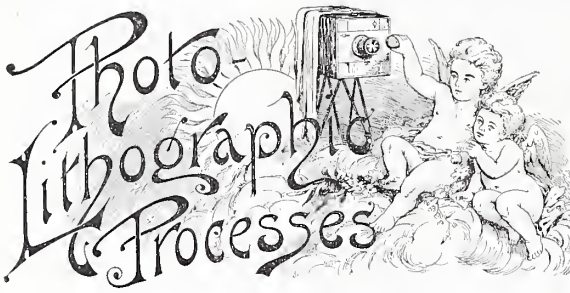
STATEMENTS having again been industriously circulated by someone desirous of injuring our credit with the craft, to the effect that our lithographic department was conducted on principles unfair to the workers, we courted the fullest investigation by the representatives of the Amalgamated Society of Lithographic Printers, and print herewith the result of the visit of the General Secretary to our works:—

"THE AMALGAMATED SOCIETY OF LITHOGRAPHIC PRINTERS  
OF GREAT BRITAIN AND IRELAND,

50 Upper Brook-street, Manchester,  
November 24th, 1892.

"STATEMENTS having been made that the establishment of Messrs. Raithby, Lawrence & Co., Ltd., the publishers of THE BRITISH LITHOGRAPHER, was not worked in accordance with the principles of trades unionism, I, as General Secretary of the Amalgamated Society of Lithographic Printers, was instructed by my Executive Committee to make enquiries as to the truth, or otherwise, of these statements. Having made enquiries, and also having interviewed Messrs. Raithby, Lawrence & Co., I am pleased to be able to state my belief that the establishment is worked strictly in accordance with the rules of the respective societies whose members are employed by the firm in question.

"GEO. D. KELLEY,  
General Secretary."

CHAPTER IX.—*Continued.*

## II.—GELATINE.

**G**ELATINE is a very comprehensive term. It includes all the qualities of gelatine used in the preparation of photographic sensitive plates, and the qualities which form glue, isinglass and table jellies. But for collotype printing, a very careful discrimination is necessary. Gelatine is the gristly portion of a bone, extracted by dissolving the osseous matter by dilute hydrochloric acid, leaving the bone cartilage. By long boiling this bone cartilage becomes gelatine, which can be finally precipitated by alcohol. Sinews and skins of animals (parchment) can also be converted into useful gelatine, whilst hoofs, horns, and harder skins are used to prepare glue. From the swimming bladder of the sturgeon, and other such-like fish, a very pure variety of gelatine is manufactured, known as isinglass. The physical properties of gelatine give it somewhat a neutral character. It is insoluble in alcohol (methylated spirit) or cold water; but with the latter it swells, and is ultimately soluble in hot water. It is not affected by vegetable colouring matters. Dry gelatine is unaffected by air, but when moist it putrefies, first turning acid, and finally giving off ammonia. Tannic acid on gelatine precipitates it, the flaky product being insoluble in water. This reaction is taken advantage of for writing, lettering, or drawing upon a collotype film, the portions of gelatine thus drawn upon by tannic acid readily taking printing ink, and being capable of giving impressions with the other work. When chromic acid is added to gelatine it forms, amongst other products, fatty acids, from which originates its ability to take printing ink. Dr. Eder, in writing on the action of potassium bichromate and gelatine, says that the mixture forms a brown substance, which he calls chromium chromate, the oxidised portion of which remains soluble and can be washed out with water. Ammonium bichromate with gelatine in the dry state is more sensitive than the potassium salt, but on the application of heat is far more liable to decompose. Those gelatines which are sold in England are of various manufactures. There are the English makes by Nelson and others, the French and the Swiss products. As a rule the English gelatine, owing to its heterogeneous origin and its chemical purification, is not so good as the

Swiss manufacture, which is almost solely derived from bull calves. Parchment also gives an excellent gelatine, both it and the Swiss gelatine being free from grease, which causes a pitted appearance in the finished article. The French gelatine made by Coignet should be avoided, as it usually contains grease.

The English gelatines can be classified as follows:—

No. 1 photographic; having a hard consistence, and suitable for Woodburytype process.

No. 2 photographic; being softer, and adapted to the collotype, wash-out, and swelled gelatine processes.

X opaque; which should be used for preparing photographic dry plates, its inability to reticulate making it almost useless for collotype or other photo-mechanical processes.

Amber; which combines the good qualities of the other gelatines, and is cheaper. Nelson's amber gelatine is sold in curled pieces, whilst the grocers' amber gelatine is in straight strips. Either of these may be used for Husband's papyrotint process of half-tone lithography.

Although it is a soft gelatine as compared with the others which are adopted for collotype films, yet there must be a degree of strength about it, and to test this the gelatines selected should be made into a jelly by dissolving in water which can be gradually heated. Thus, say 77 grains (about 5 grammes) of gelatine are dissolved in a little more than three-quarter pint of water (·789 of a pint, or 45 centilitres) and allowed to swell, then heated and allowed to cool to form a jelly. A number of samples of gelatine can be treated in different vessels of exactly the same dimensions. When the jelly is set, a piece of tin, three or four inches in diameter, having a wire soldered to its centre and carried upwards to be soldered to a small metal cup, capable of receiving some shot, can be adjusted through a movable cap on the vessel to rest upon the set jelly. Into the cup small shot can be placed until it is determined how much weight is necessary to sink the tin disc, etc., to the bottom of the gelatine. By such means it can be determined which sample of gelatine has the greatest weight-bearing capacity. Other qualities being suitable, the gelatine which can bear the greatest weight may be considered the best for collotype. This is the opinion of Lipowitz: and it is also necessary that a gelatine for collotype purposes should absorb plenty of water and swell out, but should not liquefy after soaking in cold water for twenty-four hours. Isinglass, on the other hand, begins to dissolve under such treatment. This power to absorb water shows marked differences in different gelatines; even different operators are not entirely agreed as to the quantity of water a gelatine should absorb to make it a fit one to use. Mr. W. T. Wilkinson considers a good gelatine should absorb about four to five times its weight of water. In experiments it is found that Nelson's gelatine soaked in cold water will absorb in two hours only five parts of water, whilst Creutz's gelatine will in the same time absorb thirty parts of water; but after a lapse of four and half hours more it is found that Nelson's gelatine will also have absorbed thirty parts of water. Thus both are equally absorbent, but Nelson's is a harder substance. The differences arising from these varieties



of gelatine have been carefully described by August Albert, of Vienna, who speaks of hard gelatine for collotype films as quite unsuitable. It gives a shiny transparent film on the plate, and in most cases the high and middle tones of a picture upon such a film lose their character, and give a hard appearance to the print. The plates do not give many impressions, which is further decreased by using ammonium bichromate in the film. A soft gelatine mixed with potassium bichromate, on the contrary, gives a soft blurred picture, on a dull rough film. By using ammonium bichromate this defect is somewhat remedied, still the productions are not satisfactory. The mixture of hard and soft gelatines has a better effect, but does not equal the qualities possessed by a gelatine prepared by Ferd. Friedr. Creutz. This gelatine has gradually come to be recognised by English as well as Continental operators as the one most suitable for all collotype films. It absorbs five times its own weight of water at 66°F (19°C) without any sign of decomposition or dissolution setting in after standing thirty-six hours. This middle hard gelatine of Creutz's should be used unwashed, with pure potassium bichromate. It gives a matt surface when spread upon the plate, from which a large number of runs can be taken without much depreciation of the picture and with less damping than other gelatines. Should it be necessary to have a harder gelatine for plain line work, then the addition of a little ammonium bichromate, or equal quantities of potassium and ammonium bichromates, will effect the purpose.

Having discussed the general characteristics of gelatine of the lower quality, it will be well to notice the action of the purest gelatine, viz., isinglass.

Isinglass, to be reduced to a solution, requires soaking in cold water for nearly twenty hours, and then has to be gradually raised in temperature to nearly boiling point, at which heat it must be retained for a long time. It is then finally filtered through flannel. In use for collotype films it should never exceed one-third of the entire bulk, or its softening property will cause the paper to adhere to the film and ultimately spoil the picture. It is not by any means recommended, but some operators may care to try it, because when mixed with the gelatine it gives a soft character to it, which does not dry so completely, and thus allows of prints being taken having a more even character, and being cleaner throughout. Prints from such a film have greater brilliancy, and are truer copies of nature. If isinglass be used the films should be thin. If thick they crack, and in printing require to be fed with thinner ink than gelatine films.

Having dealt thus fully with the two main constituents of the collotype film, it will be left to such opportunities as occur in describing the preparation of a film, etc., to touch upon the effects of the minor substances which enter into the work of the collotypist.

[To be continued.]



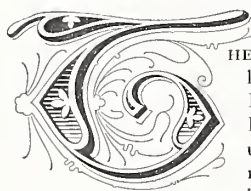
THE Belgian capital, says the *Export Journal*, contains more than eight hundred houses occupied in the various branches of the graphic arts.

THE £ S. D. OF PICTURE POSTERS.—Printing is the subject of an article in *Tit-Bits*. The writer says that the large theatrical pictures on the walls cost from 2/6 to 15/- each, the amount depending on the size of the placard. To start the business of printing such work would demand an outlay of at least £2,000. The standard size of the unit of a placard is now quad-crown, 2-ft. 6-in. × 3-ft. 4-in., and it may consist of from two to thirty sheets. The machine mostly used is one printing 60 × 40 inches, effecting a great saving, as each sheet may have to be printed four times. The artist makes a sketch of the incident of the play, which is submitted for approval. Then he draws the "blocks," or keystones, of the requisite size. The payment for this class of work varies from £2 10s. to £7 a week, according to ability. After the "blocks" have been drawn and proved, three or more stones are required for the "colours." A colour artist gets from 30/- to £3 a week. The stones weigh about half a ton each, and cost £10. As ten are wanted for the "blocks," and another thirty for the colours, an outlay of £400 is required for stones alone. The litho printing machine costs about £500, and the steam stone-grinder another £100. The machine minder gets from 42/- to 55/-.

SAND-BLAST ENGRAVING.—A revival of interest is to be noted in the application of the well-known sand blast to engraving on stone, the reason assigned for the exemption, heretofore, of this process from such application of the blast being the difficulty of providing a cheap paper material to apply to the stone—one capable of resisting the cutting action of the sand for a sufficient length of time to allow the unprotected portions of the surface to be cut away to the required depth. The prepared paper for this purpose is gummed to the face of the stone, and the design to be cut outlined on it, after which the outlines are cut through with a sharp-pointed knife, and the pieces of paper removed which cover those parts of the stone to be sunk; the blast is now applied equally over the whole stone, and, in cases where a greater depth is required to be cut, the blast is made to act on those parts for a greater length of time. By this means designs are produced which possess a far greater degree of sharpness in the outlines, including even the most delicate tracery.

HERR H. DORN, of Leipzig, informs us that Herr W. Clasen, court photographer to H.M. the Emperor of Germany, and photographer to the Royal Academy of Sciences, has at length succeeded, after fifteen years' practice in photography (collotype), in inventing and testing a process making it possible to produce phototype (collotype) plates which yield an edition of from 10,000 to 12,000 impressions, even on the hand-press, without any inclination shewing on the part of the film to peel off. The solution used is of a cheap and simple nature. It can be kept ready prepared, and passes through all the filtering and other operations with perfect ease. This is a distinct and important advance over the present methods which yield only 2,000 to 3,000 impressions, and it should do much to bring collotype within the bounds of everyday printing.

## How to Make a Lantern-Slide.



THE following extracts from a lecture delivered by Mr. S. Herbert Fry before the Putney Photographic Society may be useful:—The essential requirements of a good slide are that in it there should be absolutely

clear glass, and that the darkest shadows should be transparent. In order to secure these results, a fairly correct exposure is necessary, and forcing of development should on no account be attempted. He therefore recommended a standard developer, which, by experience, had been found to work well with the particular brand of plates in use, and no modification of this should be tried in order to compensate for over or under-exposure. The use of such a standard developer naturally required a more correct exposure, relatively, than that necessary for a negative plate, where a modification of the developer was permissible; but as the exposure of the lantern plate was under more perfect control, there would in practice, be found little difficulty in giving the right time.

The slides could be made in two ways, viz., by contact, or in the camera. Contact printing was best done by artificial light, and in the camera by daylight. Mr. Fry shewed a printing frame in which a slide could be made by contact from any suitable part of a large negative. A contrivance of the kind was a necessity in successful working, as it was of importance that the edges of the lantern plate—i.e., the thickness of the glass—should be protected against stray light. The omission of such protection was a frequent source of fog near the edges. With regard to the illuminant used during exposure, it was no doubt possible, as a *tour-de-force*, to use a wax vesta, but Mr. Fry said he would assume that the members generally worked with a paraffin lamp or gas burner, and these would, perhaps, be found the most convenient in ordinary work. Weak negatives were best printed from by a weak light, or at a considerable distance from a powerful one; whereas plucky or dense negatives would give the best results when printed close to a good light. The time of exposure would, of course, vary with the character of the negative, but the correct exposure could be readily determined in the following manner: Divide the plate approximately into, say, five strips; then shield four-fifths, and expose the one-fifth ten seconds, the shield being then moved so as to screen only three-fifths, and kept in this position another ten seconds, and so on until the whole of the plate has been exposed; one-fifth will then have been exposed ten, the next twenty, thirty, forty, and fifty seconds respectively. On developing this trial plate in the standard developer, it would at once be apparent which part of it had received the correct exposure. When the correct exposure has been once ascertained, it should be noted on the negative, together with the nature of the light and the distance from it,

for future reference. The negative envelopes now commonly in use lend themselves conveniently for notes of this kind, as well as for storage. The exposure being correct, the development in the standard developer would present no difficulties, it being only necessary to watch progress, and to take the plate out when of sufficient density.

On the subject of exposure in the camera, Mr. Fry said that could be done either in daylight or by artificial light. When daylight was used, the negative could conveniently be placed against the window, and the camera pointed at it and focussed to the desired size, care being taken that no buildings, chimneys, trees, &c., should appear behind the negative, as these would, of course, be reproduced by the lantern plate. It would not be necessary to exclude daylight from the room, but direct rays of light must be prevented from entering the lens, and this could be efficiently done by placing a piece of brown paper, with a hole cut in the centre for the negative, against the window, the paper being of such a size as to cover the cone of light entering the lens; no further covering between the negative and the lens is necessary. Daylight being very variable, no rule as to the length of exposure could be laid down; generally a small stop should by preference be used in a fair light, so that the exposure might be well under control.

As regards artificial light, the chief difficulty was to obtain even illumination. The negative is placed at the end of a suitable box or frame opposite the lens, which may be mounted in the usual way on an ordinary camera, and the lantern plate exposed in a double slide, exactly as when taking a negative. The illumination of the negative is as follows:—A piece of white opal, or white paper is placed at some little distance behind the negative and parallel with it. On each side between the negative and reflector is placed a lamp or gaslight, or other convenient illuminant; the two lights should be placed near the negative, and as close together as possible, but without allowing any part of their images to enter the field of the lens. It has been found that by this system of using reflected light about 40 per cent. of the total is utilised, and that the illumination is very even. In order to obtain the best results, as large a stop as possible, consistent with the covering power of the lens, should be used. As an example, it may be stated that with a good light and an average negative, working the lens at  $f/16$ , an exposure of four minutes will be about right. One of the advantages of the reduction method in the camera is that, by the careful use of the swing-back, divergent and convergent lines in the negative may be rectified on the slide.

On the subject of printing-in clouds, Mr. Fry said that the easiest method was to print them on a separate plate, and use this as a cover plate, due note being taken that when so placed the direction of the light would be reversed, and that, therefore, it was necessary to print from a cloud negative with the light coming from the right in order to suit a view which is lighted from the left, and *vice versa*. The cloud print should be given a comparatively short exposure, and should not be developed far, otherwise there was danger of loss of transparency.



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BY CHARLES HARRAP.

#### CHAPTER IV. LITHOGRAPHIC WRITING INK.

**I**N the whole process of lithography there is scarcely anything so important as the ink with which the design, be it pictorial or a writing, drawn, written, or transferred, is put upon the stone. Some authors aver that the lithographic process is not a chemical one, and go so far as to consider it simply mechanical. Such a conclusion, however, is not by any means borne out by the facts. Were it mechanical then any ink which would stain a stone would be equally useful with the greasy lithographic ink in use. Again, the use of the various acids, turpentine, and gum would simply be like so many washes or paints, instead of which each has a clearly defined chemical action not to be mistaken for a mere mechanical application. Undoubtedly the process contains many mechanical operations; but they are so closely allied with the chemical reactions that it is impossible to note the one without a due consideration of the other. Of these chemical actions none is so prominent as the action of the ink by which a design is worked out upon a stone.

The ink is fundamentally a grease. But simple grease cannot be manipulated, and it has to be worked up into an ink with other materials, each destined to play a part in the finished product. One of these substances is soap, and before entering into the mode of preparing the ink a few words on soap will not be out of place.

##### SOAP.

Soap is formed by treating fat with a caustic alkali. In the treatment glycerine (formerly considered a waste product) is formed in conjunction with fatty acids. These acids unite with the alkali to form salts of a somewhat neutral character. Thus it will be seen that the fat of soap is broken up into glycerine and apparently inactive salts, so far as their immediate action upon the stone is concerned. These fatty acids vary according to the nature of the fats used to produce the soap. They may be margaric, oleic, stearic, or palmitic. The nature of the soap also varies according to the character of the alkali used in its manufacture. Thus, if caustic soda be used the ordinary hard soap is produced. If caustic potash is used then the soft or sweet soap is formed; and ammonia is used to produce the medicinal soap liniment.

It is of first importance that a good soap should be used in making the ink. The good old yellow Castile soap is that which is recommended. Such a soap will have a composition very little removed from the following short recipe, viz. :—

Fatty acids	...	...	...	66 per cent.
Water	...	...	...	26 " "
Soda	...	...	...	7 " "
Mineral ash	...	...	...	1 " "

whilst the common cheap soap produced by the keen competition of modern times is mainly water. Some samples contain as high as 80% of water, and the generality are little below 40%. The remainder of the mass is produced by a mechanical conglomeration of the fatty acids and glycerine, with resin, gelatine, Fuller's earth, Cornish clay, ground flints, potter's slip, farina, dextrine, and the necessary compounds of soda. A mere inspection of this list of foreign matters shows how unsuited it is for the purpose which it has to fulfil in making ink.

It is preferable to use soap dry; and it is best dried by cutting it into shavings and putting the shavings in a jar in an oven until the moisture is driven off.

The whole and sole reason why soap is used in lithographic transfer or writing inks is to cause the other ingredients to readily dissolve. Not unfrequently the manufactured writing inks lack a sufficient quantity of soap, and the draughtsman has to add a little before getting the ink into working order. Similarly, the printer's transfer ink is occasionally improved by a small addition of soap. Its use in larger quantities results in giving the ink a slimy unsuitable character. The solvent power of soap varies, and wherever it is used it should always be used bit by bit until the necessary consistency and combination are obtained.

##### RECIPES OF INKS.

The earliest attempts in making lithographic writing inks were productive of some most simple and effective recipes. In Senefelder's own book on lithography, published in 1819, the following recipes are found :—

Soap	.....	4	4	4	4	4	4	..
Tallow	.....	4	..	8	..	4	4	2
Wax	.....	12	12	..	8	8	..	6
Shellac	.....	..	4	8	4	4	..	4
Lampblack	.....	1	1	1	1	1	1	1
Mastic	.....	..	..	4	..	..	..	3
Wax and gum guaiacum	..	..	..	..	..	..	12	..
Venetian turpentine	....	..	..	..	..	..	..	1

The use of shellac keeps these inks more liquid, and adds to the trouble in preparation. Of these various recipes there is perhaps not one which is strictly adhered to at the present time. The one most closely followed is that consisting of :—

Soap	... 4 parts.	Wax	... 8 parts.
Tallow	... 4 " "	Shellac	... 4 " "
Lampblack	... 1 part.		

and it is represented by the well-tried ink of latter days compounded with :—

Soap	... 4 parts.	Wax	... 4 parts.
Tallow	... 4 " "	Shellac	... 4 " "
Lampblack	... 1 part.		

which is slightly varied for use upon paper as compared with the recipe just quoted, which is intended

for use on stone. The "paper ink" contains of wax five parts, and of shellac only three parts, whilst the lampblack is considerably reduced.

The best lampblack is obtained by melting tallow and burning it in an ordinary lamp with a wick. The smoke is collected by putting an iron or brass plate in the flame of such a lamp, and from the plate is scraped the fine black, which is as powerful as three times the quantity of ordinary lampblack. If, however, common lampblack be used, it must be most thoroughly burnt by heating it until it ceases to give off a yellow smoke. This burning is necessary to free it from the acid of wood, which in the ink would neutralise the acids of the soap and spoil the action of the latter. The greater the quantity of lampblack used, the blacker the ink is, and the more it is apt to run and produce coarse work. The different nature of lithographic work demands that this feature should be considered. Thus, there are at present the two inks known as Vanheimbeck's and Lemerrière's. The former, a powerful pale ink suitable for the fine and accurate work of the writer; the latter, a darker variety, suitable for the stippler.

Ink should always be mixed freshly every day, and the water used should be either purposely distilled or pure rain water not too old. Any water containing lime (or hardness) is totally unsuitable, for it curdles the grease and destroys its chemical nature upon the stone.

The amount of lampblack used varies :—

1. According to the nature of the ink itself, as determined by the recipe used, and the particular character of the constituents.

2. With the purpose for which it is intended. If for stone work more can be added than for paper work.

3. When it is intended for fine work; in which case the black should be brought down to a minimum to assist the draughtsman in execution.

In determining the amount of black from the above considerations, it should be borne in mind that quantity is no gauge if the ink be not well burnt or hardened. To secure the proper performance of the latter, and a due admixture of the black, a ready test should be applied towards the end of the manufacturing process to ascertain whether the amount of black already added has been properly incorporated, and will exert its full strength in use. By taking a small quantity of the liquid ink from the pan, and putting it into an earthenware saucer, upon which is dropped sufficient distilled water to cover the ink, the black soon asserts its power. In less than a quarter of an hour the ink will go grey and slimy if not properly hardened by the burning and subsequent heating. If it retains its blackness for half an hour or more it may be considered good enough to cast into moulds for use. In the first case the ink must be kept over the fire and the fumes allowed to rise again. Every now and again the above test can be applied until a satisfactory black is obtained. When complete it should be cast in flat oblong tin moulds of any convenient size for ready handling. There is no reason why it should not be cast in thick round sticks, rather larger than the old sticks of Indian ink, instead of in flat flexible tablets as at present generally done.

Before passing on to the method of making the ink there are two more recipes which will lend additional help to anyone interested in the varying nature of "writing" ink.

The first is Senefelder's ink for working upon transfer paper, and consists of :—

Shellac ... ..	3-oz.	Mastic ... ..	5-oz.
Wax ... ..	1-oz.	Soap ... ..	4-oz.
Tallow ... ..	6-oz.	Lampblack ... ..	1-oz.

The other is a more modern recipe and consists of :—

Yellow wax ... ..	2-oz.
Clean mutton suet ... ..	1½-oz.
White Marseilles soap ... ..	6½-oz.
Shellac ... ..	3-oz.
Lampblack ... ..	1½-oz.

Although the above recipe is the accepted formula, yet it seems very probable that the amount of soap is unnecessarily large, considering that its sole object is to dissolve the other constituents. For the latter purpose, three ounces should be quite sufficient.

#### THE METHOD OF MAKING THE INK.

In the various recipes given there are fats, wax, shellac, soap, and lampblack, as well as one or two other substances. In mixing these materials, the fat and the wax are melted in an iron pan over a good source of heat, whether an open fire or a gas stove, the latter for preference owing to its regularity of heat. If a gas stove be used, it should be one in which air is largely consumed (Bunsen type) and does not give large smoky flames.

The fat and wax will soon become liquid, and should be well stirred together. At this stage a little of the soap should be added, by which means the fat and wax are brought into closer union. About one half of the full proportion of soap should be added, and the mixture being well stirred, should give off dense fumes which can be readily ignited. The practice of setting fire to these fumes has been handed down as the best, and experience may be taken as a fair guide in such matters, but in reality it is a point upon which opinions differ. The actual ignition will draw off the fumes and thicken the mixture more rapidly, but undoubtedly the heat will carbonise the mixture. The same effect can be obtained by simply allowing the fumes to pass off without igniting them. Another point of difference is as to whether the shellac should be added before or after burning. It is a substance difficult to dissolve, and although in later practice the shellac is added after burning, yet there seems considerable justification in adding it before, because in the act of burning, the shellac becomes encrusted on the mixture and then dissolves readily into it. If the shellac be added before burning, then the amount of soap must be increased from one-half to three-quarters of the full amount set down in the recipe.

The mixture having been reduced in this manner by about one-third of its original weight, the process can be stopped by putting out the flames or removing from the stove if not burning. Such cessation is only temporary. The mixture is again put upon the source of heat whilst the remaining ingredients are added and well stirred in. Before casting, the test for the



quality of the black, as already described, must be performed, and a second test must be applied by placing a small quantity of the ink in a saucer and determining whether it will dissolve in cold water. If the latter should not prove correct, then a little more soap should be added, while to increase the quantity of black to make a very intense ink, a little more soap should be added with the black. As a general rule, the quantity of soap should not exceed one-fifth of the whole, and the lampblack about one-twentieth. But the exact proportions of all the ingredients are not bound by any hard and fast line, and can be adjusted just as the maker deems best, basing his formula upon practical experience in the use of the ink.

Makers of ink would confer a very great boon upon draughtsmen by preparing a writing ink with a blue, white, or red colouring matter, especially for use in repairing fine work upon stone. No one, except those practically acquainted with this work, can conceive of the difficulty experienced in using a brush loaded with black ink upon lines already black, and defying the eyesight when going over them a second time for repairing purposes, to detect when the brush is actually upon the stone. Such colouring matter might be either indigo, blue-lake, vermilion, or red ochre. The black usually used is lampblack, but a superior ink can be made by the use of Paris or ivory black. The latter is so fine that much larger quantities can be added without destroying the working power of the ink, whilst it gives it a denser black.

#### WAX.

This material, used in the preparation of inks, crayons, etc., is mainly a fatty substance. It contains very little oxygen, and consists largely of the fatty acids combined with alcohol radicals. At ordinary temperatures the waxes are hard, but melt below  $100^{\circ}\text{C}$ . They are insoluble in water, slightly soluble in alcohol, and readily soluble in the fixed or volatile oils, such as drying oils, or the oils of turpentine, cloves, etc. The term wax is applied very generally to a whole series of such crystalline fats, including beeswax, Chinese wax, mineral wax, and spermaceti. Beeswax is made by bees from the sugary matter which they collect, and not, as frequently supposed, carried by them on their thighs from the plants visited. Wax occurs as the bloom on fruit and leaves. The Chinese wax is chemically ceryl cerotate, having a complex composition of  $\text{C}_{27}\text{H}_{55}\text{C}_{27}\text{H}_{53}\text{O}$ . Like shellac, it is produced on trees by the puncture of a species of *coccus* (insects). It melts at  $82^{\circ}\text{C}$ ., and by dry distillation yields cerotic acid and cerylene [ $(\text{C}_{27}\text{H}_{54})$  an olefine hydrocarbon]. The mineral wax is that obtained from the paraffin group, known as paraffin wax. Spermaceti is a neutral, almost tasteless fat or wax obtained from the head of the sperm whale. It is white and brittle, and melts at less than  $50^{\circ}\text{C}$ . Virgin wax is a term not generally recognised by chemists, and may be a name arising from the virgin oil of the olive tree, or as a name indicating new or pure wax.

#### SHELLAC.

Shellac is formed by the insects *Coccus lacca* puncturing the twigs and stems of some fig trees,

notably *Ficus indica*. From the resultant encrustation may be prepared the various lacs, or, by using the twigs, insects, and lac, may be manufactured the colouring pigment lac-lake. The lac is in reality a resin, which is insoluble in water, but is soluble in some acids, some alkalies, and in borax. To make it soluble in fats, it must be heated violently to free it from the lactic acid. Lac goes by a variety of names, according to its appearance. In its natural state on the twigs it is stick-lac. When washed off with water the particles are known as seed-lac. When melted and strained through coarse cotton fabric, it may be shellac when cast in flat shells, or button or ruby lac if cast in round moulds; larger masses being called sheet or piece-lac.

In referring to shellac as a resin, it should be borne in mind that the oxidation products of terebene are also resins, and that resins and balsams include lac, mastic, copal, and gum guaiacum.

#### FAT.

The last and most important substance used in lithographic writing ink is the fat. It has been shewn that the soap is not used for the fat it contains, and that shellac or other resinous bodies cannot have a similar action. Wax undoubtedly is a fatty substance, and whilst giving a firmness to the ink, co-operates with the fat in the ink to form the insoluble compound upon stone or metal, which is the true basis of lithography. In calling this compound insoluble, it is better to restrict such a remark to its insolubility in hot or cold water.

The fats which may be used in making ink are mainly mutton or beef suet, deer suet, or tallow, as being readily rendered into a pure clear oil without much foreign matter. The foreign matters should be strained out before use.

Fats are glycerides of acids. The acids belong to the fatty or acetic series and acrylic series, the latter being the ethers of glycerine. Whilst soap consists of fatty acids and glycerine, fat consists of the combination of glycerine and these acids. Suet, as obtained from the ox and sheep, contains more stearin but less palmitin than beef fat, and is more solid than the latter. These fats also contain olein. Tallow is derived from these animal fats by rendering and straining out all skin. A large amount of tallow similarly prepared comes from Russia and Siberia. Both mutton and beef suet melt below  $50^{\circ}\text{C}$ .

The basis of fat is the presence of stearin, palmitin, olein, and margarine, each of which is a compound of glycerine with the respective acid. It is well known that many chemicals readily decompose to form second compounds when brought into contact with a body for which there is a greater affinity. Thus, whether the fatty acids be applied to stone or metal, in combination with glycerine or free in ink, the effect is the same. The acid forms a compound with the stone or metal. The stearate, palmate, oleate, or margarate of lime or metal is insoluble in water. Therein lies the secret of lithography, and the compound formed upon the stone is in all probability an oleo-stearate or oleo-margarate of lime, insoluble in water. Generally, grease in its original form can be cleaned out from

a fabric or any other mechanical contact, but when compounded with stone or metal it is difficult to break up the compound without removing it bodily. Such materials as caustic soda, caustic potash, and benzine go far to absolutely remove grease from litho stone or zinc plates.

[To be continued.]

## Papers and Coloured Inks.

IT is to the interest of printers to know the influence of the different paper pulps, and of the light over the colouring matters. The question is especially important as regards the laid papers. M. Fritz, the inspector of the Imperial Printing Office at Vienna, gave a lecture upon this subject, which is reproduced at length in the *Moniteur de la Papeterie Française*, from which we extract the following:—The colouring matters are of four kinds: the ochres, the colours with bases of metallic salts, the vegetable colours, and the colours derived from coal tar. The degree of sensitiveness to light of a colour varies with the relative proportion of the colouring matter; this sensitiveness is much greater in the papers than in the tissues. Therefore, M. Fritz considers the papers as divided into three groups: (1) The rag papers. (2) The mechanical wood-pulp papers. (3) The laid papers. Most of the colours are altered in the following degrees:—The most rapidly altered by the light are those on the laid papers; those on mechanical wood-pulp papers are altered less quickly; those on rag papers are the most slowly altered. The preservation of the colour on the laid papers depends more on the superficial coat of baryta than on the pulp of the paper. The wood-pulp papers absorb less colouring matter than the rag papers, but their pulp itself is altered by the light.

The rag papers are those which best preserve the fine printing colours. The tone of these papers is scarcely altered after a long exposure to the light. The printing colours are best fixed on them, and even ink can be employed in excess on those slightly calendered without the impression appearing overcharged. The presence of wood pulp in a paper invariably causes the alteration of every colouring matter. Not only the daylight, but every other light containing chemically active rays acts on this paper. Every white paper containing but twenty per cent. of wood pulp becomes quickly yellowish. Under the direct sunlight the effect is produced within a few days; in a diffused light the change is just as certain, but more slow. Even white lead and lampblack are altered by the light when applied to a wood-pulp paper. The colours applied on laid papers for chromos stand in a less degree the light than those on unladen papers. The deeper the colours the less sensitive they are to the light. When colouring matters are mixed it is necessary to select carefully those colours having the same degree of sensitiveness to light, above all when they are to be used for wood-pulp papers; otherwise the effects obtained will not hold long.

MR. C. T. MANDER, of Messrs. Mander Brothers, is the new mayor of Wolverhampton.

## Noir à Monter en Relief.

INK TO PRODUCE RELIEF—ETCHING INK.



THE necessity of obtaining relief in a greater or less degree has been proved a valuable item in printing. It can be shewn that relief to any considerable extent is not so advantageous as might appear, for high relief acts like type and allows ink to run down the sides, which in printing gives a feathered appearance. It also tends to crease and tear a light paper. High relief, therefore, should be avoided, whilst a medium relief gives good results. The ordinary method to obtain such relief is to roll the work in a medium ink, and dust it well with talc (French chalk), or dust with resin and talc. If resin be used, then it requires to be incorporated with some solvent power. This solvent may be either the direct heat from an open fire, or from a spirit lamp having such a construction as to force the flame down upon the stone, or by putting methylated spirit on the stone and setting fire to it, or by placing over the whole stone a piece of blanket saturated with benzine and mounted on a board. The latter acts without setting fire to. The resin having thus been brought into very close union with the ink, is sufficient with the addition of a French chalk dusting to withstand the most powerful etching given by any acid. Talc alone is quite as efficient.

However, these means of securing the object have been replaced by the use of relief ink. This ink is a strong grease, having the smell of dubbin. It is too hard to work up upon a roller, and must be mixed with a black printing ink to as large an extent as possible to secure good rolling properties. Having compounded the ink, the work is washed out and well rolled up with it. It is then possible to etch the work to any extent required. The main feature of this treatment is the extreme fineness obtainable. In using resin and talc, work must be rolled over-full, thus really protecting more of the stone than necessary, and resulting in the work being a shade coarser—true it is very little—than by rolling up with relief or etching ink. In any firm, almost, it would be more economical, and certainly less trouble, to have a roller and slab kept for this etching ink alone, any transferer or printer being able to use it without all the other inconveniences of resin, talc, etc. Particulars of this new etching ink will be found on another page.

THE current number of *The Amateur Photographer* (Hazell, Watson & Viney, Ltd.), a journal devoted to the interests of photography and kindred arts and sciences, contains the first of a series of monthly supplements, fittingly entitled "Our Lantern Screen." The supplement is a valuable addition to a readable and instructive paper.

THE November number of *The Art Decorator* contains the first three reproductions by the collotype process of a series of lunettes of "The Nine Muses," which are admirably executed. The number altogether is an exceptionally good one, and well sustains the reputation of the magazine for true artistic and suggestive designs.

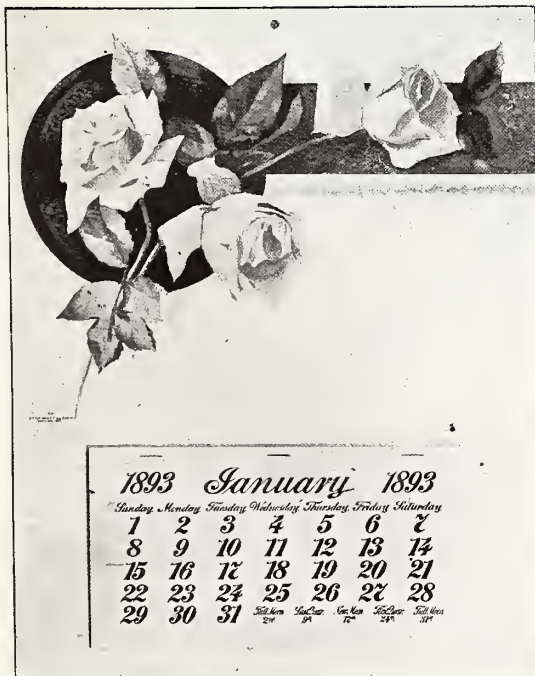


## Lowell's Steel-plate Calendars



ARE here again and Mr. M. P. McCoy, of 54 Farringdon-road, E.C., the sole European agent, has sent us along a complete set. They number 82 designs, ranging in size from the pocket-book series,  $2\frac{7}{8} \times 5$ -in., up to magnificent examples of art work well suited for the counting house, the library, or "my lady's boudoir," and include a considerable number of entirely new and original designs as well as some reprints of last year's

most popular subjects. The charming companion portraits of the Prince and Princess of Wales, of which a sufficient supply could not be secured last year, are again issued, and will certainly be welcome to all loyal subjects, especially those who desire a change from the somewhat monotonous photograph. In the new designs Messrs. Lowell & Co. have surpassed themselves in originality as well as in finished execution. One design especially, No. 641, is a gem of real art work, as chaste in conception and treatment as it is dainty and perfect in production. The foreground is a spray of white flowers and in the distance the first light of daybreak shows bright and



clear across a stretch of wooded scenery, whilst two angel figures floating in the middle distance regard the light with shaded eyes and rapt attention. The drawing and treatment of the whole design, the angel figures especially, is refined and appropriate to the advent of "Christmas Morn." Some pretty girls' heads are shown, amongst others, in Nos. 516A and 614, and amongst the dainty array of flower subjects there are a number of charming additions, notably good being No. 617A, "Fuchsias." We note also that some of the popular groups of dogs are reproduced in smaller sizes, gaining considerably by the reduction. Amongst the smaller sizes the breezy yachting and fishing subjects will be as popular as ever, and amongst the larger sizes the dashing "White Squadron," with its distinctly picturesque effects of light and shade and contrast, promises to have another run of favour. Limit of space prevents a more detailed notice of the various series, but it requires only a brief inspection of Messrs. Lowell's collection to convince anyone interested that they are keeping up their reputation for artistic and perfectly finished work. By the courtesy of Mr. McCoy we are enabled to present our readers with half-tone reproductions of some of the designs, and would advise them to see complete sets before buying. The publishers are right when they say, "There is no better investment for a printer than a set of these samples. They interest his customers, bring a profit through printing the name and address of purchasers on them, and at the end of the season can be sent out to the public giving the printer the benefit of a permanent and effective advertisement for himself for the entire year."



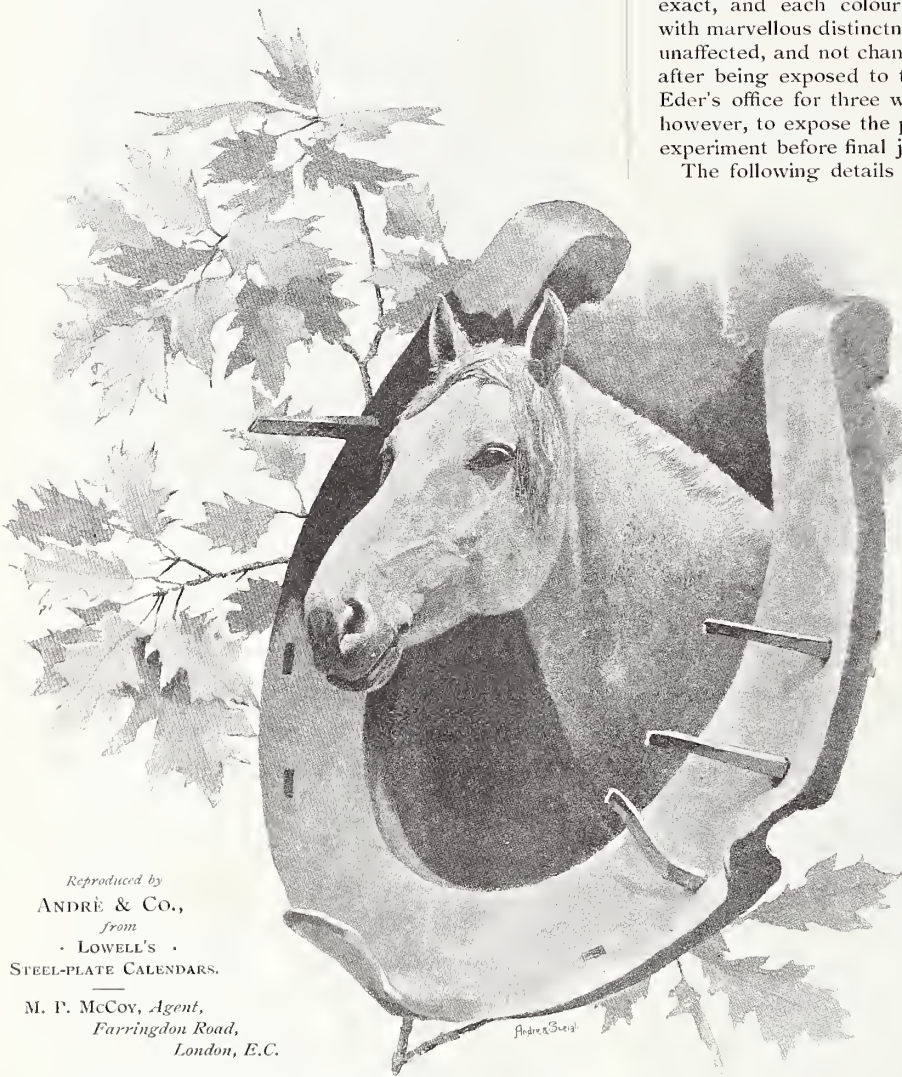
## Photographing Natural Colours.

THE Vienna correspondent of the *Standard* supplies a fuller account of the important photographic discovery made by Herr Franz Veress, Klausenburg, Transylvania. The sample photographs were shown

ground colour, upon which the red inclines more to purple than ruby, and the violet is especially brilliant. Green is missing on all positives, and it is not known whether Herr Veress has succeeded in producing it, since the photos now in Vienna were obtained some weeks ago. The outlines of the pictures are perfectly exact, and each colour stands out from the other with marvellous distinctness. The colours were quite unaffected, and not changed in the slightest degree, after being exposed to the ordinary daylight in Dr. Eder's office for three weeks. It will be necessary, however, to expose the photos to a more severe light experiment before final judgment can be passed.

The following details of the applied process have been allowed to become known. The sensitive preparation is a silver chloride emulsion in collodion, or in gelatine, and, the solution being prepared in a peculiar way, which is the inventor's secret, it is poured upon either the glass or the paper, where it soon takes a brownish red colour. The plate is put into a copying frame and exposed to the rays from a transparent coloured drawing, of which the negative picture is soon visible, the dark parts appearing, of course, in white. The exposure has to last in the case of glass negatives two or three hours, and in the case of paper at least three days, as the colours come out very slowly; but the picture having been fixed in an alkaline bath the colours become brighter and more intense. The process in the camera would require an exposure lasting several weeks, but even the ordinary process will be largely reduced if some

experiments on which Herr Veress is at present engaged succeed as well as he hopes, and according to the latest information he has already so changed his original system as greatly to lessen the time of exposure, especially for the paper negatives. Prof. Eder thinks it most likely that Herr Veress, who must be a very clever practical photographer, has by some professional device so changed the process, described by Carea Lea two years ago, of applying the photo-chlorides of silver in the form of an emulsion as to achieve what nobody before has succeeded in, namely, photographing in several colours which are permanent.



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STEEL-PLATE CALENDARS.

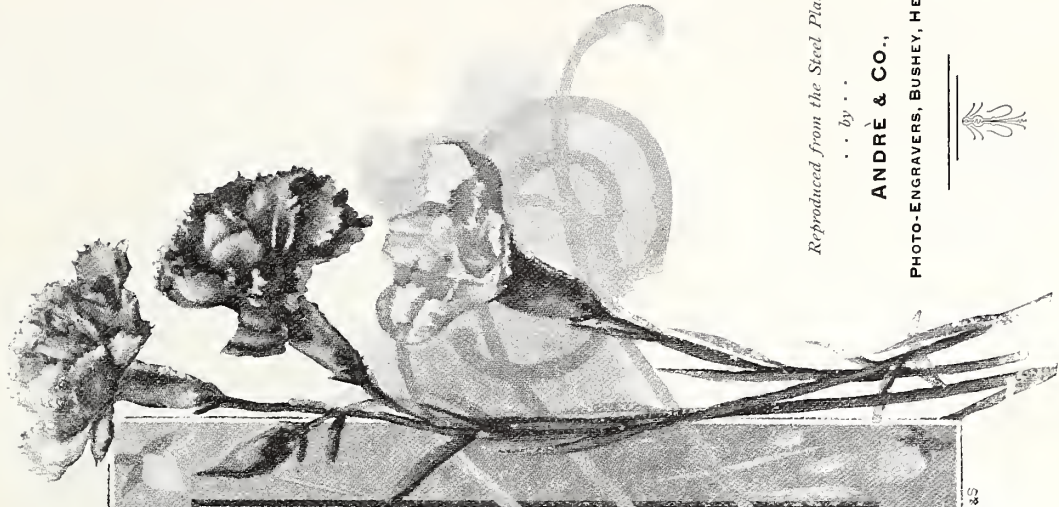
M. P. McCoy, Agent,  
Farringdon Road,  
London, E.C.

to the correspondent by Professor Eder, of the Photographic Institute at Vienna. The photographs (says the correspondent) are upon glass and upon paper. The former are dia-positives, and if looked through show, for the most part, a beautiful ruby-red ground colour, with a picture in bright, sometimes brilliant, colours, from the deepest hue of ruby-red—far deeper than the ground colour—to light orange, with several shades of red and yellow, and from violet to aniline blue, and the intensest, most brilliant blue that can be imagined. The same colours prevail also on the paper positives, which have all a greyish-brown

Lowell's  
Steel-plate  
Calendars.

M. P. MCCOY,

54 FARRINGTON ROAD, LONDON, E. C.



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# The Cross-line Half-tone Process.

REMARKS ON THE RELATION OF  
BLACK AND WHITE ON THE SCREEN.



THE great variety of effects that may be obtained in screen negatives from the same subject leads every investigator to try, or desire to try, every possible relation of black to white lines and spaces in the screen. The best relation for all purposes is indeed a very difficult and well-nigh impossible point to determine, because, firstly, the best texture in the negative depends largely on the requirements of the subsequent procedure; and, secondly, because there is so great a variety of taste and opinion regarding the desired effect in the reproduction. To arrive at any valid conclusion in the matter it is necessary to review the phenomenon which takes place in making a negative through a screen.

It is obvious that if a lined or cross-lined screen be placed in *immediate* contact with a sensitive plate in the camera, and an object photographed through it, the result will be a transfer of the lines of the screen in reverse, and in the transparent parts of the screen there will be a deposit of silver proportional to the action of light, to the same degree as there would be with the same action of light had no screen been interposed. Now, if this same screen be moved from the sensitive plate toward the lens, a distance, say, of  $\frac{1}{4}$ -inch or more, and the same subject exposed for the same length of time, the result will be a very fair picture, with very little, if any, indication of the presence of the interposed screen. The latter has been brought, so to speak, out of focus, but of course not in the sense that a picture is said to be out of focus, as the rays passed the plane occupied by the screen in as direct a manner as in the first instance. The attribute of light known as diffraction has come into play, and has affected the direction of the light sufficiently to completely eliminate the fine lines of the screen from the resulting picture.

What we desire to obtain is an amount of diffraction of the light that shall be just sufficient in the high lights to act around the lines between the junctions, and at the same time to leave the point of actual crossing quite unaffected and clear. This can be effected with a screen having *any* relation whatever of black to white, simply by adjusting the distance between the sensitive plate and the screen,\* and consequently, so far as regards that one particular requirement of yielding transparent dots in the high lights, the relation of black to white in the screen is not of paramount importance. The difference, then, which will result from a different proportion of black and white in the screen must be sought elsewhere than in the ability to produce high lights with fine black dots, or a "brilliant" result, and practice indicates that this is true. If, on the one hand, we had

a screen with very thick black lines, then, in order to obtain the desired result, we must bring about sufficient diffraction to close up the high lights into dots, and this amount will necessarily render the edges of the lines hazy and round, that is to say, lacking in sharpness, and yield a dim picture, with the fine detail more or less "fogged over."

On the other hand, if the black line be very thin, a very small amount of diffraction will be sufficient to carry the action of light around the junctions of the lines as well as around the lines between the junctions. Hence the diffraction in such a case would have to be cut down to the minimum, resulting in a tendency to show *lines* in the lighter middle tints, where there should be dots, but larger dots than those in the highest lights. This kind of a screen yields the best detail.

As in all human effort, we are obliged to balance advantages, so, also, in this particular instance, and I find that with a sharp, opaque black line, and a sharp and transparent space, where the diffraction is normal, and no extra refraction or diffraction is introduced by the presence of a collodion film or other amorphous body that tends to disperse the light unduly, a screen having the white or transparent spaces about twice as thick as the opaque lines will yield the most satisfactory results all around. In that case the refraction necessary to produce the desired results in the highest lights need not be such as to interfere with the sharpness of the lines necessary to produce good detail, and the junction points are sufficiently broad to admit of several gradations of dots before the continuous cross-lines manifest themselves.

Where a cross-lined screen has both sets of black lines equal in width, there is necessarily a point in the resulting picture where the dots cease and the lines commence, and in such a case the lines are at once crossed. When one set of lines is slightly heavier than the other, or somewhat closer together, there will be a point between the darkest dots and lightest cross-lines composed of a single set of lines, and, consequently, such a screen yields a more gradual gradation of tone from the middle tints to the shadows.

From the results of a long experience with screens of almost every variety, I give the following conclusions on the general subject of screen work:—

Greater contrast and roundness can be obtained with coarse than with fine-lined screens.

Finer detail can be obtained with fine than with coarse-lined screens.

Sharper detail can be obtained with single ruling and double exposure than with double ruling and single exposure.

Far better modulation can be obtained with double than with single-lined screens.

Sharper contrasts can be obtained with single than with double-ruled screens.

A cross-lined screen must be more perfect than a single ruling, because in the single ruling any small scratches in the glass or opaque spots in the screen will be partially neutralised by the two exposures acting alternately on the parts, while, in the double ruling, a small scratch or opaque spot remains in one place throughout the entire length of the exposure.—  
MAX LEVY in the *American Annual of Photography*.

\* With a fixed distance between screen and sensitive plate sufficient to admit the diffraction, the same effect may be brought about by varying the size of the lens aperture.



# G. B. Henderson,

## Artistic Engraver on Steel and Copper,


TO THE TRADE

32, King St. Cheapside, London, E.C.

1893

JANUARY				FEBRUARY				MARCH				APRIL					
S	1	8	15	22	29	S	5	12	19	26	S	5	12	19	26		
M	2	9	16	23	30	M	6	13	20	27	M	6	13	20	27		
T	3	10	17	24	31	T	7	14	21	28	T	7	14	21	28		
W	4	11	18	25	*	W	1	8	15	22	29	W	5	12	19	26	
T	5	12	19	26	*	T	2	9	16	23	30	T	6	13	20	27	
F	6	13	20	27	*	F	3	10	17	24	31	F	7	14	21	28	
S	7	14	21	28	*	S	4	11	18	25	*	S	8	15	22	29	
MAY				JUNE				JULY				AUGUST					
S	7	14	21	28	S	4	11	18	25	S	2	9	16	23	30		
M	1	8	15	22	29	M	5	12	19	26	M	3	10	17	24	31	
T	2	9	16	23	30	T	6	13	20	27	T	4	11	18	25	*	
W	3	10	17	24	31	W	7	14	21	28	W	5	12	19	26	*	
T	4	11	18	25	*	T	1	8	15	22	29	T	6	13	20	27	*
F	5	12	19	26	*	F	2	9	16	23	30	F	7	14	21	28	*
S	6	13	20	27	*	S	3	10	17	24	31	S	8	15	22	29	*
SEPTEMBER				OCTOBER				NOVEMBER				DECEMBER					
S	3	10	17	24	S	1	8	15	22	29	S	5	12	19	26		
M	4	11	18	25	M	2	9	16	23	30	M	6	13	20	27		
T	5	12	19	26	T	3	10	17	24	31	T	7	14	21	28		
W	6	13	20	27	W	4	11	18	25	*	W	1	8	15	22	29	
T	7	14	21	28	T	5	12	19	26	*	T	2	9	16	23	30	
F	1	8	15	22	29	F	6	13	20	27	*	F	3	10	17	24	31
S	2	9	16	23	30	S	7	14	21	28	*	S	4	11	18	25	*





## Etching, Drypoint, Mezzotint.

By HUGH PATON,

*Associate of the Royal Society of Painter-Etchers.*

### ETCHING.

**E**TCHING is the art of engraving upon a metal with an acid. The word "etch" is derived from the Dutch word *etzen*, and means "to eat." The French explain this better by their use of the phrase "*la gravure à l'eau forte*," as distinct from "*la gravure au burin*." To etch is to eat, or bite, a design in metal by means of an acid that will corrode. This cannot be too often insisted upon. Mr. Hamerton says somewhere that to speak of etching in a drawing-room a generation ago was to be misunderstood, but even to-day the chances are at least equal, when one speaks of it in ordinary company, that one shall be misunderstood to mean pen and ink drawing. It is not difficult to understand why this should be so. Etching has been for a long time a neglected and little understood art, and ignorance has applied the word to pen and ink drawing for the simple reason that there is a certain superficial likeness between the two arts. But, except that they are both methods of working in line, and so, at a glance, similar in appearance, there is nothing in common between them. The process of etching is briefly this:—A sheet of polished copper, after being thoroughly cleaned, is covered with a thin ground of wax and other ingredients, calculated to resist acid. This is smoked until quite black, to enable the etcher to see clearly the progress of his work. Upon this ground the design is drawn with a steel, or other smooth, hard, point, which cuts the wax and bares the copper, the colour of the latter showing clearly against the black ground. The acid is then poured upon the plate and allowed to bite, to corrode, the lines drawn in the ground, for the length of time required. The result is that the design is bitten into the metal to a greater or less depth according to the length of the time of biting. From the plate so engraved a proof is taken upon damp paper. The plate is inked all over, and then cleaned off in such manner as to leave the surface clean and the lines filled with ink. The paper is then laid upon the plate, backed by a blanket to make the pressure uniform, and the whole is passed through a roller press. The proof so obtained is called an "etching."

Before proceeding to describe in detail the actual process, it may be well to explain that it will be necessary, for clearness' sake, to divide these papers into two parts. I have been requested to give full technical information upon all points, but to stop and do that first would only lead to confusion on the reader's part. After just indicating the materials that are necessary to enable the beginner to set to work,

it is my purpose to give a straightforward description of the method which experience suggests as the simplest and most direct. The reader need not, in the meantime, concern himself with anything further than is here described, but later on the fullest possible information on all technical points will be given. Indeed, the latter would not be of practical use to him now, for the proper appreciation of it depends upon some previous knowledge of the processes and their difficulties. If a personal explanation may be pardoned, the writer's experience suggests this as the best course. A beginning was made by consulting Mr. Hamerton's "Handbook," which gives a brief practical description of various processes, and is an invaluable volume for reference. But it leaves the beginner in a state of distraction bordering upon despair, for want of sufficient knowledge to enable him to choose the best method. When that was discarded, and M. Lalanne's simple description of the nitric process followed, all was clear, and practical results were soon forthcoming. If the reader will, therefore, supply himself in the meantime with the things which are indicated as necessary, and follow the method here described, much of the initial difficulty will disappear, and the experience so gained will make the technical information, to be given later, of practical value.

#### LIST OF MATERIALS.

Copper plates.	Ball of etching ground.
Hand-vice, with wooden handle.	Bottle of liquid ditto.
Etching needles.	Bottle of stopping-out varnish.
Scraper and burnisher.	Nitric acid (S.G., 1 $\frac{1}{4}$ 20) in stoppered bottle.
Oil sharpening stone.	Turpentine.
Porcelain bath, say 8 x 10 in.	A silk dabber.
Etching board and hand-rest (from local joiner).	

#### SUNDRIES.

Small camel-hair brushes.	Tripoli powder.
Wax tapers.	Some feathers.
Blotting paper.	Glass funnel.
Transparent tracing paper.	Small pipette.
Chalk (white or red).	Magnifying glass.
Lump of whitening.	Pocket spirit level.
Willow charcoal (a thick stick).	Some small wedges of wood.

All the above are necessary for the beginner, and should not cost more than £1 5s., including two or three small plates.

All the materials can be obtained direct from Messrs. B. Winstone & Sons, Shoe-lane, E.C.; or Messrs. Hughes & Kimber, Limited, West Harding-street, E.C.; or from Messrs. Winsor & Newton, Robertson & Sons, &c., through the art material shops.

A special needle of solid steel, which I recommend, is obtainable from Mr. E. Crossland, 23 Trinity-street, Huddersfield; also the other tools.

I have obtained excellent plates locally from Mr. J. Robinson, Eastnor-street, City-road, Manchester.

Such items as the acid, porcelain bath, etc., are best obtained from the nearest dealer in chemical apparatus.

Very excellent grounds in every form are made by Mr. W. W. Rhind, 69 Gloucester-road, Regent's-park, N.W. Mr. Rhind also supplies plates ground ready for use.

Write to these parties for price lists, and select according to requirements.

#### THE ILLUSTRATIONS.

These are inserted as being strictly interpretative of the text, and are chosen for their technical, not their artistic, qualities. No apology is made for the fact that they are not in some respects as perfect, technically, as they might be, the object being rather



to "point a moral" than "adorn a tale." They are strictly illustrative of the processes described, and their faults are such as show the technical errors into which the beginner is liable to fall, and are intended to put him on his guard. To illustrate "etching" I have chosen an early plate for this very reason. The attentive reader will, it is hoped, have no difficulty in following the text with the plates for reference. A few explanatory remarks will accompany each plate for his guidance.

#### IN THE STUDIO.

At last then, my practical reader, we are in the studio, and the door is shut, for interruption is fatal to the temper and the success of the experiment. All the necessary materials and tools are beside us. An old suit of clothes, or an apron with a bib to cover the breast, is advisable. These bright yellow spots on my coat are due to unguarded drops of nitric. Your joiner has made you a sketching board, a small drawing board with a well sunk in it three sixteenths of an inch, and large enough to leave a margin all round your plate. A handy size is 12 x 16-inch board, with the well 7 x 9-inches. This takes any size of plate up to 6 x 8-inches. If you have two made of the same outside size, you can carry two prepared plates, face to face, for out-door work. You have two needles, one sharp and fine, the other moderately coarse, and an old point for occasional use in the acid. The hand-rest is a tough piece of wood, 2 to 3 inches wide, the length of your board, and just stout enough not to bend under the weight of the hand. This can be moved about, and enables you to work all over the plate without any danger of injuring the ground.

#### PREPARATION OF THE PLATE.

Here is a sheet of polished copper, 4 x 6-inches, which will do for our first experiment. It has been well hammered before being polished, and is of a fine even grain. The first thing to be done is to clean it thoroughly with turpentine and a rag, and then with a touch of whitening, all this to ensure the surface being quite free from grease. The next thing to be done is to ground the plate so that it will withstand the acid. The best method of doing this is to use the liquid ground, but as the method of the old etchers is frequently useful, we shall adopt it for a start. Fasten the plate in the hand-vice by one corner, putting a piece of stout paper between its jaws, in order not to mark the copper. Here is a ball of etching ground tied in silk. Hold it with one hand over the plate, and heat the latter gently over a spirit lamp, or the gas turned half down. The plate should not be heated too rapidly, or too much. As soon as the ground begins to ooze through the silk, dab the ball all over the plate until you have covered every part. Keep the plate just warm enough to melt the ground, but no more; if burned it is ruined. Do not let the ground gather thickly at any part; keep it as thin as possible. Now take the dabber and gently dab the ground all over, until it is evenly distributed. The ball part of the thumb makes the best dabber I know, and if the plate be kept at such a heat as will just allow this to be used comfortably, it is sufficient, and the ground will not be burned. If the ground

be rather thick—and it should be as thin as you can get it—it can be removed by the dabber. What is superfluous can be dabbed on to another plate.

I ought, however, to point out that the great objection to this method is that it is difficult, if not impossible, to prevent the incorporation of dust in the ground, especially during the dabbing process. The liquid form of ground has, in my practice, superseded the ball, except for occasional use. It is strongly to be advised, as it is safer, and much less troublesome. To use it, take the bottle in one hand, and holding the plate level in the other, pour upon it sufficient of the liquid to run freely to all the corners. Immediately pour back the surplus, and lay the plate flat to dry. After getting the liquid down your sleeve a time or two, you will do this safely, without any difficulty. It is advisable at the last moment before pouring on the liquid, to blow away any dust that may have settled on the plate. Dust in the ground is the *bête noire* of the etcher. A speck of dust in the ground means a spot on the plate, where no spot should be. Do not forget to replace the stopper in the bottle at once. The solvent evaporates rapidly, and the ground becomes thick. The plate will be surface dry in a minute or two, and it is then ready for smoking. Fasten it in the hand-vice at one corner, or at the edge. Light a couple of wax tapers, loosely twisted together, and, holding the plate face downwards, pass the flame rapidly back and forward and across in every direction. Pay rather more attention to the edges, as the smoke tends to accumulate in the centre. The flame may touch the ground, but it must not linger. The wick of the taper must not touch the ground by any chance, or it is ruined. At first the ground is dull, but as the plate heats it melts, becoming smooth and shiny, and the smoke is thoroughly incorporated with it. Sometimes it will be found advisable to heat the plate gently before smoking; some grounds take the smoke better if melted first. As soon as the colour of the copper is lost, and the ground is uniformly black, lay the plate aside for five minutes to cool. Properly smoked it should be of a slightly dull black, but perfectly even and smooth. If there be any parts which show the raw smoke, the ground has been burned, and it must be cleaned off with turpentine, and done again. Never be content with a plate that is not uniformly smooth and perfectly black, or the result will be disaster when the acid is put upon it. Also, if the ground show distinctly iridescent, it has been burned, though apparently perfect. Adapt the light to the size of the plate. A single taper is sufficient for a small plate, and two for medium and larger plates. A frequent cause of burned ground is over-heating in smoking. To prevent this, hold the flame away from under the plate for a few seconds at frequent intervals. To pass the flame continuously over the plate, until the ground is quite black, makes it too hot; especially if the flame be large in relation to the size of the plate.

The plate is now ready for the work with the needle. Place it in the well of the drawing board, and fasten down with drawing pins. With the hand-rest upon the board, you can move about over it with

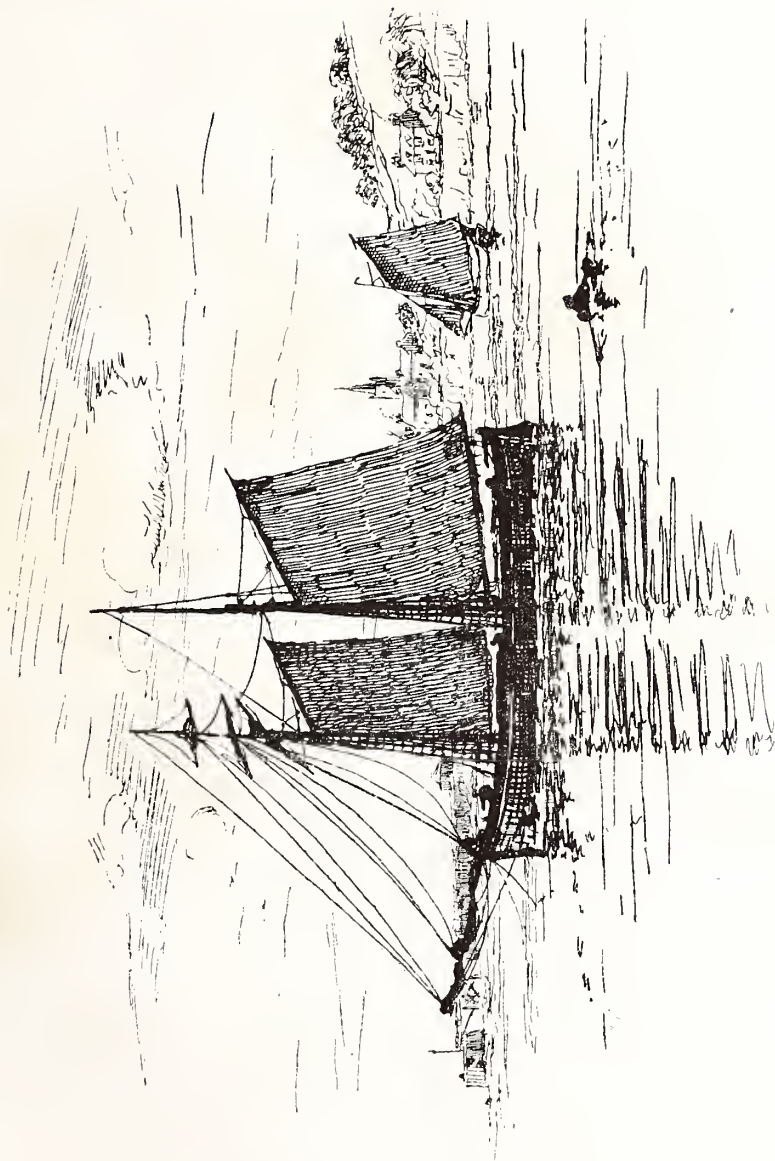


PLATE II.—ETCHING—FIRST STAGE.

REPRODUCED FROM A "CLEAN" PROOF (TAKEN WITHOUT TONE), IN ORDER TO SHOW EXACT STATE OF PLATE.





perfect freedom and safety. The ground will bear slight touches with the finger, but it is better not to touch it at all, as it is easily injured. Now we are ready to proceed with our drawing.

#### THE TRACING.

But, you say, what about the tracing? Well, let me say, once for all, that etching is an original artist's process, and you must try to dispense with everything that suggests the line engraver. Show me your sketch book. Here are some drawings of boats which will suit our purpose excellently well. These are drawn correctly and freely, and without any sign of alterations. Why not draw them direct upon the copper in the same way? I must insist upon it that there is no more inherent difficulty in drawing upon the prepared copper than in drawing upon a sheet of paper, and you must make a practice of so doing, as soon, at least, as you have learned the process. However, since it is your first attempt, we shall make a tracing, in order to avoid hesitation and uncertainty. Also, in order to your complete instruction, we shall make the drawing *in reverse*, so that it will come out right in the print. In this drawing, for example, the stem of the vessel faces to the left. If you were to draw that straight upon the plate, it would face to the right in the proof. For a simple composition of this kind, it is a matter of indifference which way it faces, inasmuch as the composition, light and shade, etc., are not affected in the least degree; it is as much a picture the one way as the other. But if you were making a direct drawing of, for example, a friend taking a sketch, as I once did, he would come out in the proof left-handed, and would reproach you in consequence. (For simplicity's sake I have described in the text the illustration as it appears in the proof, but the reader will remember that, with the plate before him from which this proof is taken, he would have to read right for left, and *vice versa*. It is manifest that if a sheet of paper be placed *face downwards* upon an inked plate, and passed through the press, the proof will show the design in reverse as far as right and left are concerned. The picture, however, does *not* stand on its head on the plate!) Here, therefore, is the method of reversing your drawing, and transferring it to the plate at the same time. Cover the original with a sheet of transparent tracing paper, on which you have previously marked the size of your plate, and make an outline drawing sufficient to be a guide for your work afterwards. If you are altering the size of the original, you must sketch on the tracing paper to the scale required. Use a hard pencil, or better still, a fine pen, so that the lines will show through distinctly. Rub the *face* of this drawing with chalk, red or white, and place the plate upon it face downwards. Fold over the edges and fasten them to the back of the plate. Go over the tracing with a hard pencil or blunt needle point, pressing firmly but not too hard, lest you injure the ground, and the outline will be found transferred distinctly to the black surface of the plate. You can also transfer a pencil outline to the face of the plate by placing the drawing upon it, face downwards, and passing it through the press. The lead, however, does not

show so distinctly on the black ground; the chalk is better. Cultivate, however, as much as possible, the habit of direct work upon the plate. It will have a good effect in two ways; first, by giving you confidence, which is everything in original work; and secondly, by making you consider every line before you draw it. Every line upon an etched plate should tell, and not a single line should be drawn that is superfluous. In etching you must not scribble, or your work will be a reproach to you ever afterwards.

For direct work, it may be useful sometimes to make a preliminary sketch upon the grounded plate, and the best method of doing this is to draw lightly upon it with a fine brush and gamboge, as prepared for ordinary water-colour painting. The colour does not take very kindly to the ground, but with the brush not too full, and the colour not too thick, the main masses may be sketched in with sufficient clearness. The gamboge, however, disappears under the acid, and the first sketch cannot be relied upon after the first biting, though it can be renewed as required. The same remark applies, by the way, to the chalk tracing.

[To be continued.]

\* \* \* \*

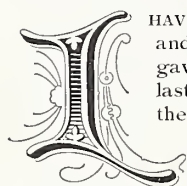
#### The Annual Exhibition of the Photographic Society of Great Britain,

WHICH was opened on September 26th at the Gallery of the Royal Society of Painters in Water Colours, and remained open until November 10, contained as usual many beautiful examples of this most fascinating of modern arts, but as far as photolithography is concerned there was little of direct interest. One exhibit, however, deserves special note, namely, 404 in the official catalogue—a photograph of Mont Blanc, by F. Boissounas, taken at a distance of fifty-six miles with Dallmeyer's tele-photographic lens. Mont Blanc has been photographed at this distance many times, but never before with the same results. With this lens the rifts, ridges, and the snow appear near, and the result is as though the photograph was taken at a very short distance. The application of this new discovery must revolutionise the art. It is well known that objects photographed beyond a very moderate distance become so small in the result as to be practically useless, but with the new lens cattle at three hundred yards have appeared with the greatest distinctness, and distant mountains, as in the example exhibited, have had much of their beauty of detail permanently secured. The applications of the tele-photographic lens are boundless, and will doubtless prove a salient feature of future photography. Many fine examples from the Autotype Co. and Woodbury prints were shown. No. 250, a carbon enlargement (7×5-ft.) from a whole plate negative, is exceedingly fine, and as a study of a storm-tossed sea is, we think, unsurpassed. Altogether the exhibition was thoroughly good, and indicative of the progress of the art.

\* \* \* \*

THE LITHO-WRITING COMPETITION.—The first prize has been won by Mr. A. S. Farrell, 58 Park-grove, Battersea, S.W.

## Instructions for Carbon Printing.



HAVE been asked by many for further and more detailed instructions than I gave in my article on carbon printing last year, and am greatly pleased at the interest that is being taken in this, my pet process for positives. I give here my own working formulæ and my method. Many advocate

transferring from collodionised glass or zinc plates, but as I obtain as good results by using paper, either single or double transfer, as may be required, I shall not speak of collodion transfer.

The outfit required for carbon work comprises a band of carbon paper of the colour you prefer, a little of single and double transfer paper, a deep tray of porcelain or agate, a glossy rubber plate, a squeegee, and a set of finger tips.

The formula I use for sensitizer is:—

Bichromate of potash, C. P. ... ..	1½-oz.
Ammonia ... ..	1-dr.
Alcohol ... ..	4-oz.
Water ... ..	50-oz.

The bichromate is all that is really necessary to sensitize, but I add the ammonia for the sake of making the paper pliable and smooth, and the alcohol to facilitate drying. This sensitizer will keep for months, but should be strengthened with bichromate occasionally.

The single transfer paper is made by dipping smooth and well-sized paper in the following, and drawing it over a glass rod to remove all surplus solution; then hang up to dry.

Nelson's No. 1 gelatine ... ..	4-oz.
Water (warm) ... ..	25-oz.

Dissolve thoroughly and then add fifty to seventy grains of chrome alum dissolved in five ounces of water. This will solidify the gelatine, which must be restored to fluidity with as much No. 8 acetic acid as may be necessary.

Double transfer paper is made by dipping smooth but extra heavy paper, the same way as single, in:—

Yellow bees' wax (pure) ... ..	1-dr.
Resin (powdered) ... ..	3½-dr.
Rectified spirits of turpentine ... ..	10-oz.

Heat in a water bath until completely dissolved. Always have a bucket of water ready when making this, or, better yet, *don't* make it. It can be bought all prepared.

*To Sensitize.*—Into a deep agate or porcelain tray, pour enough sensitizer to nearly fill it. Slide a piece of carbon paper, colour side down into this fluid, removing all air bubbles from front and back with a camel's-hair duster wet with the sensitizer. The paper will curl at first, but will soon flatten out. The sensitizer should be at a temperature of 50°, and the sensitizing of each sheet should occupy three minutes. Warm sensitizer, in my experience, means absolute failure. After three minutes' soaking, remove the sheet, colour side down, to a polished plate of hard rubber, wet with sensitizer, and squeegee it (from the centre outwards) to insure a smooth face,

remove from the plate and hang in a dark and rather warm room to dry, which will take from four to six hours. If the sensitizing is done at night, the paper will be ready to use next morning. It keeps about three days, but is best fresh. If fifty grains of salicylic acid are added to the sensitizer, and the sensitized paper kept in a tight box, it will keep longer, sometimes two weeks. Under no circumstances must the drying be hastened. Paper dried quickly is hard, slow in printing, and yields a poor print.

*To Print.*—The negatives must be given a border of black paper—lantern slide binders are excellent. This is called a safe edge and facilitates transferring. Place a sheet of sensitized carbon paper, colour side down, in the frame against the face of the edged negative, and set it out to print. As no image is visible on this paper, printing can only be judged by comparison. The simplest way is to put a negative of equal density in the same light and make a print on old ready-sensitized silver paper at the same time. I find this answers perfectly, for when the silver print is made, the carbon is also timed properly. As nothing is lost in development, it must not be over-printed; when the silver print is at just the required depth, the carbon is printed correctly. If the time required to print in the bright sun is noted on the safe edge, no difficulty will be experienced in future. Those who wish to employ a photometer in place of the silver paper will find directions accompanying it for use with carbon tissue.

*Development.*—If single transfer is used, cut a piece of single transfer paper a trifle larger than the print, and allow it and the print to soak to limpness in water. Lay the transfer paper on a glass plate and dip it under the carbon print in the water, centre the print on the paper and squeegee both into intimate contact, then lift the two (which adhere tightly) from the glass and place under pressure between blotters for ten or fifteen minutes. Place them in an agate pan, carbon paper up, and pour warm water on. As soon as the pigment begins to ooze out from the edges, the backing can be pulled off, leaving all the pigment on the paper. All that remains to be done is to rock the tray gently, changing the water if necessary, until all the soluble pigment is washed away and the picture stands out clear with perfect whites. Then rinse in water containing a little chrome alum and hang up to dry.

If a positive on opal glass is wanted, the carbon print is squeegeed on the mat surface side and developed as for single transfer. If single transfer or glass is used the picture will be reversed, but in the majority of pictures this makes no difference. If, however, the picture is not wanted reversed, it is squeegeed on to double transfer paper and developed. When dry, it is wet and squeegeed on to a piece of single transfer paper and hung up to dry. When dry it can be peeled off the double transfer paper, but will adhere to the single transfer paper.

I would strongly advise the use of rubber finger-tips when sensitizing, as bichromate of potash is not a good thing to get on a cut finger, or even for the pores of the skin to absorb. If blisters occur, lower the temperature of the water used in developing.

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Be sure the negatives are edged.

Don't over-print.

By following the directions one who never made a carbon before will have success, and as the process becomes better mastered the worker in carbon will have ample reward.

Better and more detailed instruction is contained in Boelte's little book, which can be had together with all necessary materials. What I have given, however, is all that is really necessary.—EDWARD W. NEWCOMB, in *American Annual of Photography*.

## Spots in Lithography.

HE spots are a true scourge in lithography, especially when crayon drawings are to be printed; they give rise to a great many more or less unpleasant mishaps.

We are going to disclose their origin, says Charles Verneuil in *l'Imprimerie*, and to suggest the means of getting rid of them, or at least of those which a long habit of observation has brought within the reach of the printers who have communicated the information to us. The principal spots are produced by grease, dirt, the acids, the gum, and the water.

**SALIVA (OR SPITTLE) SPOTS.**—These proceed from the execution of the composition; they are the least annoying, and turn into white points from the first proofs. The crayon or the ink laid over the spittle drops is prevented from penetrating the stone, owing to the presence of that humidity and adheres to the paper, leaving small circular spots in blank. This is easily corrected by re-touching them with No. 1 crayon or ink. Then the operation of inking slowly is resorted to, after allowing the crayon or the ink sufficient time to take. A sheet is printed, and if the retouches do not hold fast, they are applied again. This will be enough to prevent them from reappearing.

**ACID SPOTS.**—If the spittle spots are almost always the result of carelessness on the part of the draughtsmen, or the inquisitive persons who approach them while they are working, the acid spots are due to the unskilfulness of the printer, whether he lets some drops of this corrosive liquid fall in, or resorts to the use of the acid during the work of printing, thereby destroying the saponaceous principle of the crayon or the ink. The repairing of these spots is not sure; the work of retouching, which cannot be dispensed with, is often unsuccessful; in any case they are injurious to the purity of the drawing. The following are the most efficacious means employed to repair this damage as we have them from the excellent practitioners, Desportes, Engelman, and Bergeron. When the greasy body which forms the lines has been only half removed, and the strokes of the crayon, or those of the pen are still discernible, a small sponge wet in clear water is taken and rubbed over a piece of soap, making it to form a lather on the sponge by pressing it several times between the fingers. After wetting the stone, the part attacked by the acid is rubbed softly with the soapy sponge. The stone is then wetted again and inked slowly. A blackish tint is formed over the part which has been rubbed, but if the soap has not been


left too long to dry on the stone, this tint can be easily removed by rubbing it slightly with the wet fingers. Another means is to rub the weak part with a piece of cloth blackened with a little preserving black diluted in a few drops of linseed oil. When this is resorted to, it will be necessary to wet the stone with plenty of water, to wipe, to wet it again, and ink it.

**GREASE SPOTS.**—These are the most tenacious, and can only be destroyed by a radical process, that is, by effacing the spot with a pumice-stone, as in impasting, giving a new grain and making up again the damaged part.

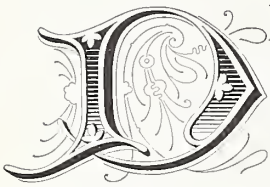
**THE WATER SPOTS** are the more dangerous, as they affect the half-tones, and the operation of re-touching never render their entire harmony to the even backgrounds. A water made luke-warm by summer heat, or simply impure, is sufficient to make them appear in the midst of the work of printing. The water spots may arise immediately from a salt or acid in the water, from alum or saltpetre, from wetting with sweating fingers, from carelessness in extending at once with the fine sponge used for wetting the water just employed to sprinkle the stone. The first inconvenience is avoided by procuring clean water and changing it often during hot weather; the second by throwing the water into a sponge or on the borders of the stone, and not over the composition; finally, by wetting the stone as soon as the sheet is printed, which prevents the surface of the stone from being invaded by too much unevenness (or roughness).

**GUM SPOTS.**—The stones of too tender a nature are liable to these spots. Nothing is easier than to avoid them by inking the stone every time the work of printing is suspended, and gumming it then.

## Burnt-in Photography on Glass.

T is not improbable that the art of glass staining and decoration will be revolutionised by the invention of a New York photographer. Transparent pictures on glass have long been made by photography, and are among the most beautiful and useful products of that really wonderful art; but in the strong light in which they necessarily are hung to develop their charm they sooner or later fade, or cleave from the glass, and "like the baseless fabric of a vision, leave not a track behind." For many years the inventor has been desirous of securing pictures of this class in a permanent form, and at last has secured a pigment which can be sensitised and printed upon translucent or transparent glass, and burnt in. The pictures have all the softness and charm of the best style of photograph, yet are melted into the surface of the glass, and are absolutely permanent. The pictures are perfect in themselves, but when one imagines the combination of the beautiful colours imparted by the skilled artists in the present art of glass decoration, the results will be invaluable. Many classic subjects have been reproduced in colours for window purposes at a small fraction of the cost of hand painting, and, of course, with photographic fidelity.

## The Colour Question.



LAGUERRE and his co-workers aimed at nothing less than to discover a process by which the image of the camera obscura could be caught and fixed in all the varied colours, just as it is transmitted

through the lens to the translucent screen.

From their experiments came forth the daguerreotype, which, although considered very wonderful, was looked upon but as the forerunner of the perfect colour process, the discovery of which was thought to be just at hand. The public had not been educated to appreciate likeness in monochrome, and the productions of the camera were thought more of as curiosities than as portrait works of art. The following quotation from an English cyclopædia, published as late as 1853, gives some idea of what was thought of the new pictures. The author says: "Various attempts have been made to adopt photogenic drawing to the sketching of miniature portraits from life; but, although likenesses are obtained, they have a dull leaden hue, and the countenance has a death-like, unpleasant appearance. Besides, as the slightest movement of the head while sitting, or even the winking of the eyes, cause derangement in the action of the sun's rays, all representations from life have less or more a muzzy or confused appearance. We have seen miniature likenesses taken on paper instead of plates, but they wanted the liveliness and force of likenesses executed with the pencil. To all appearance, photogenic drawing will be limited in its utility to the taking of representations of buildings or scenes in still nature, to be afterward copied at leisure; the perfect faithfulness of the delineation being altogether unapproachable by artistic skill."

To improve the "leaden-hued" and "death-like" daguerreotypes, recourse was had to artificial colouring, which, although crude in the extreme, was accepted as a makeshift till the real colour process should be discovered.

But the daguerreotype ran its course and fell, and other processes came forward, only to give way in turn to something better, till photography has become what it now is, and although the colour question still continues to be agitated with much interest, no practical working process has yet been discovered. As a rule, the people have become used to the tone of the silver print, and the want of colour in photographs is now rarely commented on; what demand there is for coloured photographic portraits being supplied by tinting regular photographs with water colours, which, in these days of true values of light and shadow, can be made to produce very satisfactory results. Indeed, it is a question with me, if we were now given a complicated colour process, if it would come into general use for portrait work; for, no matter how perfect the process might be, we could not hope to have it possess the knack of flattery of a portrait painter, and as the real colour of the human face is generally far from the ideal, before we could

make our work saleable, we would have to go to work on the finished prints with paints and brush, improving nature the same as if we were "real artists." So you see little would be gained over the present method of colouring photographs.

The manipulations of the new process would have to be simple indeed to justify its being adopted, the ideal colour process being one by which Mary Jane can be tint-typed for twenty-five cents, in all the glory of rosy cheeks and many-coloured costume. Let the niche in the rotunda of the National Museum, opposite to the one now occupied by the Daguerre memorial, be reserved for the monument in the future to be erected to the memory of the man who shall invent such a process.

Although we have failed in directly making colour photographs, coloured pictures have been made in a most ingenious manner, by taking several negatives through screens of the primary colours, and afterward printing in inks of corresponding colours from photo-lithograph plates made from the different negatives. This method, although rather roundabout, is regarded by many as the nearest practical solution of the colour problem. Mr. Frederick Ives in America, and Mr. A. W. Scott in England, have each patented instruments by which pictures, taken from nature, can be thrown on the lantern screen in colours. Mr. Ives takes three negatives from the same position, on different parts of the same plate, through films of orange, green, and blue, respectively. Positives from these are then projected into the same disk on the lantern screen through films of like colours, which produce the desired effect.

Mr. Scott's process consists of making four negatives on the same plate, through films of red, yellow, blue, and violet; the size of the stops used in the four lenses being in inverse ratio to the actinic value of the screens employed; so, by exposing all four simultaneously for the same length of time, negatives of the same relative exposure are obtained. The combined images are thrown on the screen much as in Mr. Ives' process. Mr. Scott has had his "verak" camera and lantern on the market for some time, and predicts a great future for his process.

We hear that Mr. Ives is working on an instrument by which his triple slides can be viewed as a one-coloured picture of microscopic dimensions: and simultaneously comes the news of Edison's wonderful kinetograph. Is it too much to look for a union some day of the principles of the stereoscope, colour microscope, and kinetograph in such a way as to show a scene with stereoscopic solidity, in natural colours, in which little figures will move about and talk? Then find a way to send the whole thing by wire, and we will be in a position to outdo the uncanny performances of Mr. Haggard's "She" herself.

You say it will never be, but who knows? We are still going on, and it may be that the most advanced views, expressed by the ablest writers, will seem as strange to readers of 1932 as the words of the cyclopædia published forty years ago do to us to-day.—J. WILL BARBOUR, in *American Annual of Photography*





# Lithographic Printing Machinery in France.

BY A. VALETTE. • PART II.



So as to avoid the vibration of the supports—vibration produced more particularly in the larger machines with the long points situated about the cylinder—there has been added to the supports of the table the piece H, which, by the help of the arrangement indicated on the design, tends to sustain them at the end. This particular arrangement is a very important one, and even necessary for the best work.

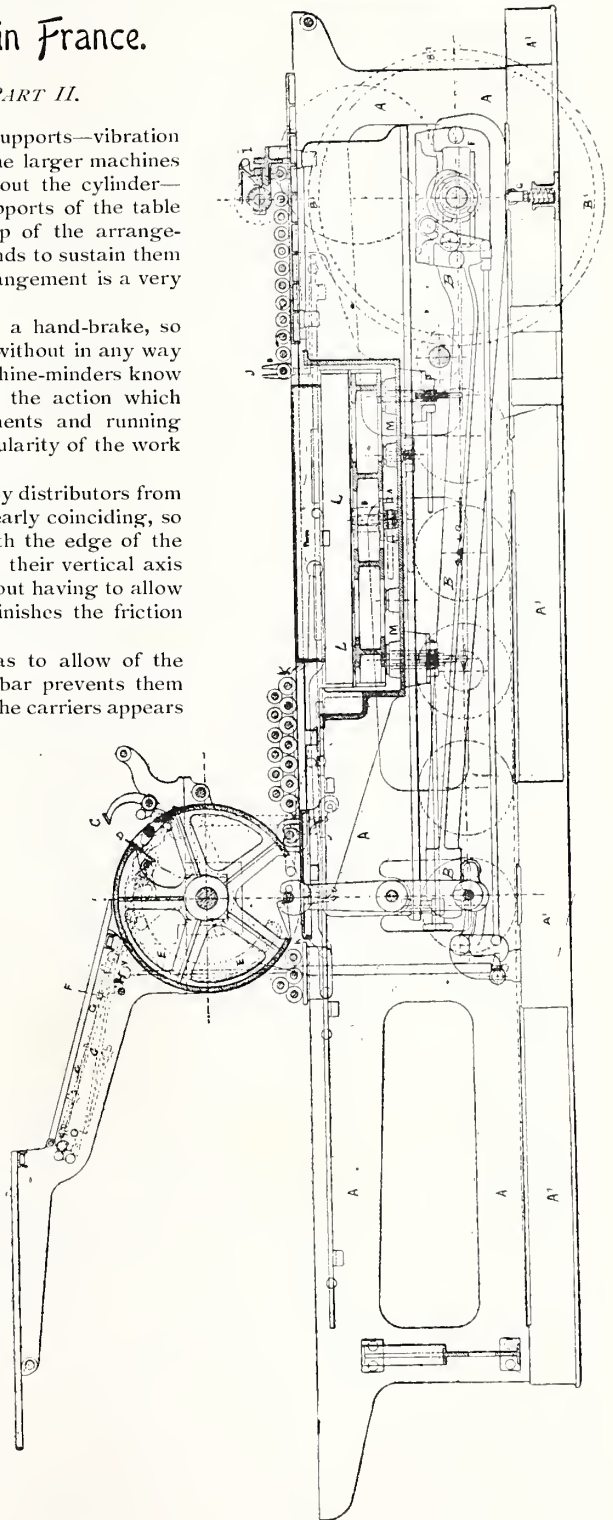
The inking arrangements are under the control of a hand-brake, so arranged that the whole can be stopped immediately, without in any way affecting the motion of the machine. Experienced machine-minders know the enormous advantage of this, and will appreciate the action which allows of independent control over inking arrangements and running power. Besides this, there is no disturbance in the regularity of the work of the distributors, and no loss by waste of ink.

The racks which are usually employed are replaced by distributors from the fixed teeth at J, their height near the edge very nearly coinciding, so as to avoid the clashing of the distributing rollers with the edge of the inking table. Further, the mobility of the teeth about their vertical axis permits of an inclination in the angle of the rollers without having to allow any play in the teeth, whilst it also considerably diminishes the friction against the rollers.

The edges of the roller carriers are so disposed as to allow of the employment of various sizes of rollers, while a long bar prevents them from leaving their places. This angular disposition of the carriers appears to have special advantages for colour work, and especially for almost all classes of fine work, and the inking is regular enough for large tinted surfaces or flat colours. The machine-minder should take carefully into account the manner in which the pins are placed; the rollers should be in all points parallel to the cylinder.

The manner in which the rollers fit over the table may be noted. The under-portion of the rollers touches the inking table by means of a simple lever acting by a cam on two inclined planes, K, which are actuated successively on each of the rollers, causing a very gentle movement. This arrangement allows of two of the rollers being raised together, and the same apparatus fitted to the larger machines allows of the rollers being lifted without the machineman having to go round the machine. The packing for the stones, or blocks intended as supports, is made with the assistance of the screws supporting the platen. The early machine makers entirely omitted the principle of rapid fixing; in fact, in all the older machines the platens were fixed, and the packing made by means of pieces of cardboard packed under the stones.

The firm of Marinoni were the first to take out a patent, in 1863, for a system of packing, by means of a platen with four screw supports. The patent rights for America only were transferred to Messrs. Hoe, of New York. No sooner did this invention become public property than French machine builders, who had appreciated the advantage, adapted it to their machines, and this invention has ultimately been brought to much perfection, till to-day our machines are all fitted in this manner.



The screw supports are governed from the front of the machine by means of wheels fixed to the ends of shafts bearing the angle wheels, in which are endless screws which move the screw supports placed in the four corners of the platen L. The system of raising, or packing, by means of the four screws is a very useful and practical one for some sizes of machines, but may become somewhat defective if applied to machines of larger dimensions, as the centre of the platen is unsupported. There is a slight curve from the passage of the stone under the cylinder, but this is so slight that it avoids any violent contact with the stone, and so as to break the force, the Marinoni firm adapted to its new machines a fifth screw support, this being placed exactly in the centre of the platen. Thus it does not really serve as a support, and is not as long as the others, being altered to any length the machine-minder desires, in taking into account the impression obtained by the use of the other four screws.

The carriage M, as is the case with most machines of this class, is moved by the connecting rod attached to the lower part and led across to the widest or longest part, and during all its course regulated by two large guides fixed to the framework, which are also capable of being regulated according to speed. These enable a perfect rectilinear movement to be obtained for both carriage and stone.

Another arrangement of the carriage is somewhat interesting, being the addition of rails fixed to the structure, and forming an inclined plane for the lifting of the cylinder at the beginning and close of the impression, so as to avoid the shock produced in all machines at the moment when the stone or zinc plate comes in contact with the cylinder. The frequent jar so produced at this conjunction is very prejudicial to work, as it frequently leads to disarrangements in the packing, causing the card or plate generally placed under the stone and the platen to break the force, to slip. I have seen these slips take place, and where the machinist did not notice it, move five or six inches, and cause the stone to break.

If this new arrangement is appreciated for work from stones, it is even more valuable for zinc-plate work, and all lithographers who have had to go through the various methods of working know the difficulty they had to keep the paper they were printing from catching on the edge of the plate, and often all the efforts made were unable to prevent the plate from rising. By the new method of impression the difficulty will be overcome, and any slipping will be perceived, thus tending to popularise the plates.

[To be continued.]

\* \* \*

### The Advertiser's View of it.

IF Mars is really peopled, as astronomers declare, There ought to be a means devised for reaching people there;

We might build a bridge or railroad—though it's not an easy grade—

For the holidays are coming, and we ought to catch their trade.

JOHN R. BARRETT.

Photographers are ahead of all other tradespeople, for they have already worked Mars photographically.

## "Plant Form" Supplement, No. 8.

### THE CHRYSANTHEMUM.

OUR illustration this time speaks for itself, and scarcely needs any description. It is perhaps known to but few that there are edible chrysanthemums. According to an American paper, the Japanese do not raise chrysanthemums as ornamental plants, but cultivate them as edible ones. Only the flowers are employed by amateurs. These are eaten as a salad, after being steeped in water and then boiled. In Japan the flowers of the chrysanthemum constitute a truly popular dish, and during the months of November and December bunches of them, washed and carefully displayed, may be seen in the stores of all the dealers in vegetables. Strictly speaking, almost all the varieties are edible, but preference is usually given to those with small deep yellow flower heads, and which are not so pretty as the varieties cultivated for ornament.

### The Title-page to Volume I.

WE inadvertently omitted to mention in our last issue that nearly a dozen subscribers sent in descriptions of how they supposed the chromo title-page to volume I. (which appeared in No. 6) was produced, but not one described it correctly. We may now say that the entire job was printed from etched zinc plates, the drawings for the same being made in our own artists' department, and the plates prepared to work on a letterpress machine. Nearly every one who essayed to describe it from the evidence of the print itself wrote it down as pure lithography throughout. Only one described it as from zinc plates. This shows that the border line between lithography and letterpress, with the aid of photography, is approaching so close that it is daily becoming more difficult to define, even by printers themselves.

COLOUR-PRINTING FROM THREE PLATES.—A new process has lately been patented by Dr. E. Albert, of the well-known Munich art-publishing firm, which enables very excellent pictures to be produced on an ordinary printing press by the use of three autotype plates. These plates are produced like ordinary autotype plates, each covering the whole extent of the picture and differing only in the proportion of light and shade. A specimen now before us is printed in yellow, blue, and red. The yellow is first printed, then the blue, which gives the requisite greenish tints, and finally the red, which gives the lights and shadows and brown tints where required. The effect is pleasing, the lights coming out better than the shadows, which seem a little too violet. This, however, is a defect which the majority of mankind would probably not notice. In any case, there can be no doubt that for popular magazines which desire to give their readers coloured illustrations without a great outlay of either time or money, the new three-plate process means a considerable increase in the means at their disposal for colour printing.



Supplement to "the British Lithographer."

Varieties  
of  
Chrysanthemums.



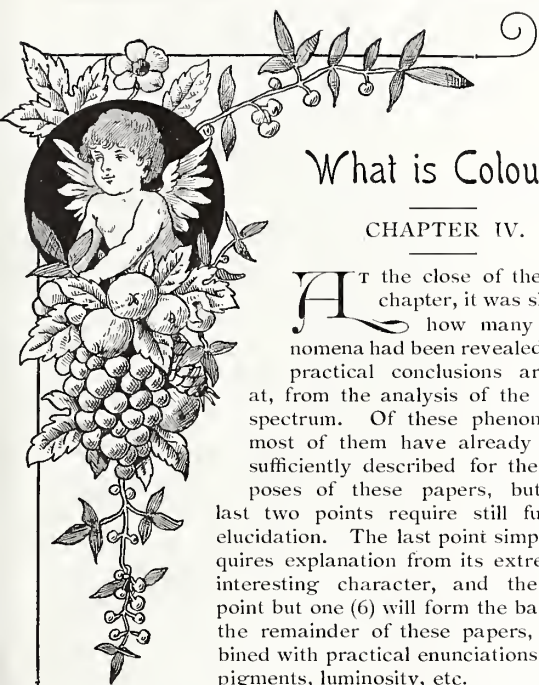
Plant Form N<sup>o</sup> 7.

Printed on Grosvenor, Chater & Co.  
"ACME". Printing Paper.

De Montfort Press Lith.







## What is Colour?

### CHAPTER IV.

**A**T the close of the last chapter, it was shewn how many phenomena had been revealed, and practical conclusions arrived at, from the analysis of the solar spectrum. Of these phenomena, most of them have already been sufficiently described for the purposes of these papers, but the last two points require still further elucidation. The last point simply requires explanation from its extremely interesting character, and the last point but one (6) will form the basis of the remainder of these papers, combined with practical enunciations upon pigments, luminosity, etc.

The dark lines which occur in the solar spectrum were, until 1802, scarcely noticed; or if noticed, were not in any way examined. It was then that both Wollaston & Fraunhofer independently made them a particular study. The latter, who had marked out the position of between five and six hundred lines, became recognised as their discoverer, and since then the lines have been known as Fraunhofer's lines. Since the primary discovery subsequent additions have been made, and the number now known rather exceeds three thousand. Of these lines, just a few do not keep their position definitely, but are apt to vary from time to time. What these lines are, remained a comparative mystery until Professor Stokes pointed out, in 1852, the possibility that vapours of certain metals existed in the atmosphere of the sun, and that such vapours actually interrupted the rays of light from the same incandescent metals existing in the body of the sun itself. Such a theory was soon verified by actual laboratory experiments, and so clearly was this demonstrated by Kirchhoff and others, that the researches on this branch of analysis soon claimed the attention of a large number of physicists, with the result that it soon became accepted as the means of detecting the presence of any metal by its characteristic continuous spectrum, or by the line spectrum of its vapour. In a multitude of ways spectrum analysis has been utilised to discover the constituents of the stars, to discriminate the composition of liquids and pigments. It has been clearly shown that however close a resemblance in colour may be made between liquids or between solids, as soon as spectrum analysis is applied the resemblances are at once banished, and the true composition of the colour of each body is depicted on the screen. Not

only does this spectrum analysis shew the components of the colour of any body, but the spectrum has been so closely studied in conjunction with the lines which cut it up that the spectrum reveals also, by analogy, the chemical composition of such body. However true or however false this theory may be as regards the distant objects of the solar system, its tenets hold good for the bodies upon this earth, and it is those which in the main affect our daily existence and require our daily attention. Such, in brief, is the great scope of the dark lines of the solar spectrum, the crowning theory being that those bodies which we now consider as chemical elements are in all probability compounds; that in the body of the sun these so-called elements become simplified, and in the end the obvious conclusion is that there is but one chemical nature, one luminous body, one sound, one heat, and one life, all of which may be but one series of vibrations brought into a multitude of dissimilar conjunctions, resulting in what appears to the human eye a series of complex and divergent existencies or oscillations, having little in common.

In these important discoveries, photography has played a very great part. When metals or metallic vapours have been experimented on, a photograph has been taken of the results, and immediately against such a photograph a second one has been taken from the solar spectrum. This has been done by using a screen over the sensitive plate in the camera, and exposing only given portions of the plate at each given operation. Such direct comparison has shewn the exact coincidence between the bright lines of some metallic spectra and the dark lines of the solar spectrum.

The practical outcome of this engrossing subject is that any simple or compound pigment, any stain upon paper, any colour in a print, can be subjected to spectral analysis and its composition defined.

### CHAPTER V.

#### COLOUR.

In the previous chapters it has been briefly discussed as to how colour is produced by the disintegration of white light. Experiments have been quoted, and to a small extent the history of the important discoveries in light and colour have been related. The character of the spectrum and its dark lines have received sufficient attention, but so far the vein has been rather to discuss colour as a branch of transmitted light through transparent media, and not either as a branch of painting or printing with pigments having a vastly different nature to the glass prisms and mirrors used in spectrum analysis. It has been left to this and subsequent chapters to first draw comparisons between spectrum colours and pigment colours, and secondly to deal with pigments as printing materials.

The spectrum is a breaking up of white light, and from the same broken light white light can be readily built up. Not so with colours. If, for instance, a proper proportion of the blue, green, and red lights be compounded from the spectrum, the result is white light. If, again, a proper proportion of blue and yellow lights from the spectrum be compounded, the

resultant light is white. Such results are impossible with pigments. To mix blue, green, and red will give a grey, and the mixture of blue and yellow pigments will give green. But a nearer approach to the compounding of spectrum colours can be attained by using painted discs, each disc having a spectrum colour painted upon it, or such other colour as an experimenter may desire. These discs can be cut from the centre to the circumference along one radius only, and can then be mounted upon a rotating axis, and arranged to overlap one another to any extent. This apparatus is known as Maxwell's disc apparatus, and from it some interesting deductions can be made.

The colours most useful for experiments are vermilion, emerald green, French ultramarine blue, chrome yellow, with lampblack and zinc white. The first experiment is to produce white, or as near white as possible, and for this purpose the vermilion, emerald green, and ultramarine discs can be put on and overlapped, so that at the circumference the number of degrees occupied by the sectors of the respective discs should be:—

Vermilion ... 124°

Emerald green 143°

Ultramarine ... 93° = 360°

This, however, gives a grey, equal in intensity to putting on the black and white discs and giving them a circumferential measure in degrees of:—

Black ... 278°

White ... 82° = 360°

A series of such experiments shews further that to match colours by this disc apparatus it is necessary to degrade the colours by adding some black, and heightening their brilliance by the addition of some white, both of which can be introduced as discs of the same size as the rest, or placed outside with a patch of the colour to be matched, forming a circumferential ring.

From these results the first deduction is, that although prismatic or spectrum colours can be recombined to form any compound up to white, yet as soon as the same thing is attempted by Maxwell's apparatus, it fails in a certain degree. In the first case the colours are the pure constituents of white light, in the second case the colours are the result of reflections from impure pigments in a state of rapid rotation, such as they never assume in the ordinary ways of nature. Thus the consideration of the scheme of colour is lowered from its purest source to the attempt at imitation by Maxwell's discs, and a further experiment will still increase the divergence and bring the matter entirely within practical colouring. Mr. Rood conducted a series of experiments with Maxwell's disc apparatus and tabulated his results in

the most methodical manner. Herewith is appended an extract from his readings sufficient to shew the point which is in view.

The first column shews the pigments which were used to paint the discs, and in each case one-half of each disc was exposed. The second column shews the colour which was seen when these discs were rotated. The third column shews the colour which the pigments in the first column produced when mixed in the same proportions. And the fourth column shews what coloured discs and the amount of each must be used on the rotating apparatus to obtain the same colour that is produced by mixing the pigments as in the third column. The circumference of the circle was divided into 100 parts, and the figures in the first and fourth columns therefore indicate percentages.

Pigments used.	Colour produced by rotation.	Colour produced by palette mixture.	Discs required on the rotating apparatus to produce the colours of the palette mixture.
{ 50 Violet carmine } { 50 Hooker's green }	Yellow grey ...	Brown ... ..	{ 21 Violet carmine. 22½ Hooker's green. 4 Vermilion. 52½ Black.
{ 50 Violet carmine } { 50 Gamboge ... }	Pale yellow grey	Sepia grey ... ..	{ 54 Violet carmine. 26 Gamboge. 20 Black.
{ 50 Violet carmine } { 50 Green [Gamboge and Prussian blue] }	Greenish grey ...	Grey ... ..	{ 50 Violet carmine. 18 Hooker's green. 32 Black.
{ 50 Violet carmine } { 50 Prussian blue ... }	Blue grey ... ..	Blue grey ... ..	{ 47 Violet carmine. 49 Prussian blue. 4 Black.
{ 50 Violet carmine } { 50 Carmine ... }	Pink purple ... ..	Dull red purple ...	{ 36 Violet carmine. 37 Carmine. 8 Ultramarine. 19 Black.
{ 50 Gamboge ... }	Pale greenish grey	Full blue green ...	{ 12 Gamboge. 42 Prussian blue. 44 Hooker's green. 5 Black.
{ 50 Vermilion ... }	Red purple ... ..	Dull violet purple	{ 20 Vermilion. 25 Ultramarine. 51 Black. 9 White.
{ 50 Hooker's green } { 50 Carmine ... }	Yellowish flesh ...	Brick red ... ..	{ 23½ Hooker's green. 22½ Carmine. 52½ Vermilion. 16 Black.
{ 50 Green [Gamboge and Prussian blue] } { 50 Carmine ... }	Pale reddish flesh	Dull dark red ...	{ 50 Hooker's green. 24 Carmine. 26 Black.

These results shew clearly that reflected light from rotating colours is not of the same kind as the light reflected by stationary compounded pigments. Much greater, then, is the difference between prismatic colours and pigment colours. If there were no other difference, the extreme brilliance of colour transmitted through transparent media is so much greater than pigment colours that the latter would require a considerable elevation to in any way compare with the prismatic colours. The differences arise from the absorption of light by pigmented surfaces. Spectrum colours are not produced by absorption, the Fraunhofer's lines alone being due to that cause. The colours of pigments are entirely due to absorption, combined with their ability to reflect some one or more constituents of white light. All materials reflect some of the white light which falls upon them. A



surface coated with lampblack even reflects some 3·4 per cent. of white light, whilst coloured bodies reflect greater quantities of normal white light, together with the peculiar colour characteristic to them. Each body has the power of selective absorption, and when white light falls upon its surface some of its constituents get lost or absorbed, whilst the remaining constituents are reflected and denote the colour of such body. Why this absorption takes place is still a matter of conjecture. It seems to depend upon the molecular constitution of a body, and may result from internal reflections getting lost within the body, or impeded by interference of waves of other light, or of the molecules of the body itself. But that is immaterial; it is outside the pale of these papers to touch upon the curious crystalline formation of bodies which results in different colours.

One of the most striking peculiarities is the formation of green by mixing blue and yellow pigments, whilst blue and yellow light properly combined give white. This difference has been the point of divergence between the Young-Helmholtz theory of the violet, green, and red primaries, and the Brewster theory of the blue, yellow, and red primaries. This difference of opinion does not affect the colour mixer. It is simply a battle of theory or a battle of words, and does not in any way influence the practical uses of colours.

However, so much interest has been centred around this point that a brief explanation is necessary. If a spectrum band be thrown upon a strip of yellow painted paper, it will be seen that only the yellow, green, and red rays are reflected, the blue-green and blues being quenched. Place in the band of light a similar strip of blue painted paper and it will be seen that only a small amount of red is reflected, whilst blue-green and blue are largely reflected. These pigments, then, absorb certain colours and transmit others. The colour of a pigment depends largely upon the power of reflection of the substratum on which it is painted. Thus, yellow pigment receives white light from the sun's light and absorbs or obstructs the blue-green and blue rays, allowing only yellow, green, and red to pass through its substance and be reflected back from the surface of the paper. Since red and green lights can be combined to form yellow, their presence simply assists in brightening the yellow. But should yellow and blue be mixed and painted on a paper surface then the white light which has been filtered by the yellow particles is again filtered by the blue particles before it reaches the white paper and is reflected. As already shown, the yellow particles allow only yellow, green, and red light to pass on towards the paper. The blue particles obstruct the yellow and the bulk of the red rays, only allowing a small amount of red light with the full amount of green light to pass on and be reflected from the paper. If the blue lies over the yellow the same selective absorption or obstruction takes place, the result being a green varying in shade with the different proportions of the pigments used.

Whilst on this point it might be well to add that as long as the theory of colour principally lay with artists there was reasonable ground for their assumption as

to red, yellow, and blue being the primary colours, since they worked with impure colours, viz., those of pigments. When, however, the question was taken up by the physicist, with more exact methods of experimenting and with pure colours, the falsity of the old triad was soon capable of proof.

Notwithstanding that this is the case, yet it is necessary for convenience of treatment to call red, yellow, and blue the primary pigments to assist in the further elucidation of the question of practical colouring.

[To be continued.]

THE LONDON LETTERPRESS PRINTING MACHINE MANAGERS' BENEVOLENT AND TECHNICAL GUILD recently started, is intended to assist its members pecuniarily, and afford them opportunities for technical instruction—both praiseworthy objects that might be adopted by lithographers as well. The method of procedure is to gather information as to new forms of machines and alterations or improvements in existing ones; the best means of overcoming difficulties in the working of various coloured inks; as to photo-etching, Woodburytype, Dallatype, heliotype, lime, chalk-washed, and all other forms of engraving, so far as they are likely to interest the members; the various makes of rollers, and other similar objects. When this information has been obtained, the intention is to get capable persons, either members of the guild or otherwise, to impart it to the members in the form of lectures, illustrated by plans, drawings, specimens, &c. The promoters of the guild are sanguine that, when their aims are known, employers, inventors, and others will readily come to their assistance. Mr. T. M. Harrington and Mr. D. Rosenbaum are the honorary secretaries, and the office is at the Machine Managers' Society House, 134 Salisbury-square, E.C. The subscription is the nominal sum of one shilling per quarter, and the meeting night is the first Monday in each month.

THE LIGHTNING LITHO STIPPLER.—At the recent Printing Trades' Exhibition at the Agricultural Hall, London, one of the most conspicuous patents was the litho stippler. In our account of the exhibition, in another column, we have entered sufficiently into its details to enable any of our readers to fully grasp the importance and the far-reaching adaptability of this excellent instrument. Since seeing it at work at the exhibition, we have been favoured with further proofs that it is all which is claimed for it. The prints now to hand shew that it can be used with the utmost success in every branch of stippling, and that whatever the terms of use or purchase may be, it would be a great consideration in the economy of large works of chromo art.

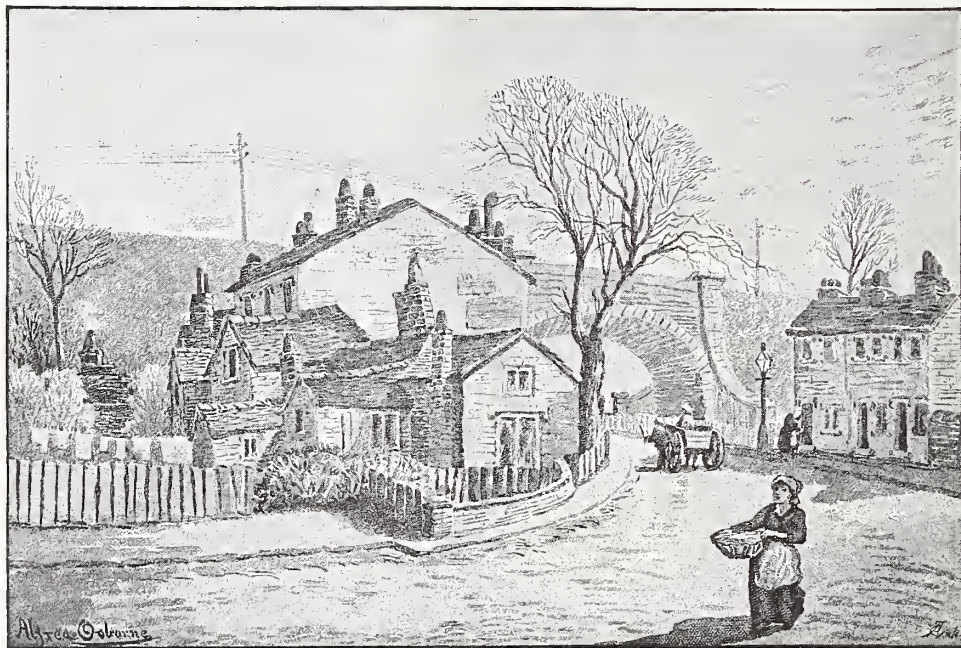
THE *City Press* notes that a very generous act was performed a few weeks ago by Mr. De La Rue in the interests of the Royal Hospital for Diseases of the Chest. Mr. De La Rue, who is the chairman of the council, placed at the disposal of the secretary as many as 60,000 lithographed copies of a letter of appeal by the treasurer. More than this, he provided 12,000 stamped envelopes in order that the appeals might go out without any expense to the charity.

## Book Notes.

“THE MAKING OF BIRMINGHAM,” by Robt. K. Dent (J. L. Allday, Edmund-street, Birmingham), is an illustrated serial publication, to be complete in twenty-four monthly parts. Since January last, when the first number appeared, there has been a steady issue of careful and readable numbers, amply fulfilling the promise of the prospectus. The work presents the story of the town from its foundation in early Saxon times, down to its position as the second provincial city in England. Recent discoveries have enabled the description of old Birmingham to be much more

developments of the populous town. We have nothing but praise for the work typographically, Mr. Allday having evidently given his best care to the production of this useful and interesting publication, which we believe is destined to become a standard work of more than local circulation. Copies may be obtained from the publisher, or from the London agents, Simpkin, Marshall & Co. A subscriber's copy is £1 1s. net, handsomely bound; *édition de luxe*, fifty copies only, numbered and signed, £3 3s. net.

“THE EXETER PICTORIAL,” by Robt. K. Dent (J. L. Allday, Edmund-street, Birmingham, demy 4to, 1/-), is an historical and descriptive sketch for the use of visitors and residents of that charming old



A BIT OF OLD HANDSWORTH, BIRMINGHAM. SCENE OF THE LAST BULL FIGHT IN BIRMINGHAM.  
From "The Making of Birmingham."

complete than was formerly possible, and the later portions of the town's history, the gradual growth during the seventeenth century, the industrial enterprise of the eighteenth century, the rise and growth of local government, the political struggles which marked the earlier years of the nineteenth century, the history of the corporation and of the religious, philanthropic, and social enterprises which have given a special character to the life of the town, have all been important factors in "The Making of Birmingham." There are numerous illustrations of quaint and picturesque portions of the town, and reproductions of contemporary drawings, prints, maps, and plans, besides the commencement of a series of first-class "process" blocks which will illustrate the later

city. The "Queen of the West" affords much scope for the pencil of the artist and the pen of the historian, and it is not too much to say that the book is worthy of the subject, both as regards the compilation and printing; forming a creditable number of the "Pictorial" series by the same author and publishers. There are over forty clear and well-printed pages, illustrated by some thirty "half-tone" blocks, all well treated, and forming, perhaps, the attraction of the book. The descriptive matter is largely historical, as is fitting in the case of such an old, though still progressive city, and the contents are also calculated to give a large amount of good general information on the city as it stands now. Visitors to Devonshire will welcome the "Pictorial" as a valuable souvenir.

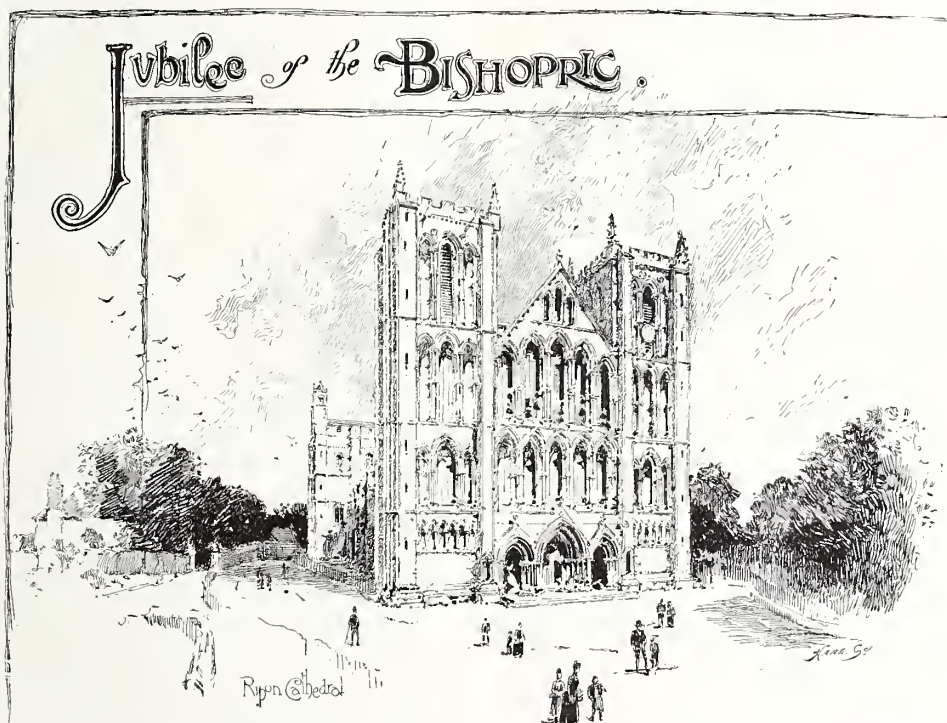




THE famous old city of Ripon, noteworthy as possessing special civil and ecclesiastical privileges for more than a thousand years, celebrated in 1886 its millenary. The occasion was decidedly a most unique one, and the authorities celebrated it in a highly appropriate fashion.

So interesting and eventful an occasion could not be forgotten, and it was considered to be a duty to make a permanent record of the whole of the anniversary proceedings. Thus

Book of Ripon"; and a list of rare flowering plants to be found in the district. The whole record is capitally written, and abounds in matters of interest to readers. The illustrative portion forms an interesting series of etchings, woodcuts, engravings, half-tone and zinc reproductions of charming views of picturesque localities and buildings, with portraits of celebrities taking part in the celebration. A large number of emblematical initials and head and tailpieces are fittingly inserted in the work, and a tastefully-designed rubricated title-page commences the volume. This unusually fine specimen of bookwork calls for special commendation to those engaged in its production. The handsome title-page, and the many dainty sketches throughout the book, well illustrate both the subjects and the ability of Mr. Herbert Railton, the artist;



"The Ripon Millenary: A Record of the Festival," a splendid quarto, beautifully illustrated and well got-up in every respect, has been issued to mark the occasion, and in every way forms a fitting souvenir, the first part describing the various ceremonies included in the festival, with other circumstances attendant upon them; the whole affording highly interesting reading. The second half of the book gives an "Historical Sketch of Ancient Ripon, Ecclesiastical and Civil," by the Rev. W. C. Lukis, M.A., F.S.A.; "A Review of the Festival," by the Dean of Ripon; "The Millenary Record," from early British times; a "List of Waken and Mayors of Ripon, from A.D. 1400 to the present time"—a compendium of curious old-time information, "The Towne

while the charming etchings by Mr. J. Jellicoe, the appropriate initials and headpieces by Mr. J. H. Metcalfe, and the excellent portraits by Mrs. Hall, all add their share to the completeness of the volume. A large share of the credit due for the production is fairly earned by the printer, Mr. William Harrison, of *The Chronicle* office, Ripon. The effect of slightly-toned superfine paper, ample margins, and red-line borders is skilfully brought out, and the whole tone is remarkably pleasing. The presswork more especially is noticeable for the uniform high standard maintained and the intelligent taste displayed in the use of art colours and tints. The volume, which is very tastefully bound, is a valuable and interesting production, alike creditable to author and printer.



"A PRACTICAL GUIDE TO PHOTOGRAPHIC AND PHOTO-MECHANICAL PRINTING PROCESSES," by W. K. Burton, now of the Imperial University, Tokio, Japan, (Marion & Co., 22 and 23 Soho-square, London, W.) which has just appeared in a new and revised edition, worthily sustains the reputation of the author for thoroughness. With the object of endeavouring to give practical instruction in the working of all processes in actual everyday use, the information is given in so full a manner as to serve as a guide to those wishful to practise the processes, and with this intention, both the older and more recent methods are described. Using the term "Photographic Printing" as a name for such processes as are applicable to flexible supports, and thus applicable for the purpose of producing pictures in large quantities, the various phases of silver printing are detailed, and throughout the descriptions the utmost care is taken that nothing shall escape notice. The consideration of other manipulations in contact printing, carbon processes, platinotype, etc., leads to the part of the work more nearly concerning the printer—that of the discussion of the various photo-mechanical printing processes, and it may be safely said that this portion of the subject is the most complete of present-day manuals. The Woodburytype, collotype, photo-lithography, Albortype, heliotype, line relief, intaglio, and half-tone block processes are fully explained, and the "wrinkles" to be obtained from this part of the work are unlimited in number. The last chapter is devoted to a description of the production of transparencies on transparent positives. Prof. Burton's book is well worthy the attention of printers of all grades. The applications of photography to the "art preservative" are becoming so widespread, that enterprising printers cannot afford to be ignorant of the progress which is being made in this direction, while the student of photography will find in its pages a vast amount of information of a truly practicable character. The volume is highly creditable to the printers and publishers in general get-up and clearness of printing, and we can heartily recommend it to the notice of all our readers.

COLOURING PHOTOGRAPHS.—An improved method of colouring photographs has been devised by Mr. D. McNae, of 10 Markham-square, Chelsea, which, though provisionally protected, will probably not be patented. The colours, which can be either transparent or opaque, are applied hot on the front of the photograph either before or after burnishing, but must be done before enamelling. The colours withstand hot gelatine, and are applied after preparation with a secret liquid. The appearance is as though the colours had been photographed direct. The process is to be known as maxotint, and some specimens we have seen leave nothing to be desired, as they can be rubbed, and even burnished, without injuring the colouring, while the new process is much more expeditious than other methods.

THE walls of the Royal Exchange in London are to be painted with pictures from the epoch-making incidents in the annals of London. The first picture is to be executed by Sir Frederick Leighton.

THE frontispiece of *The Magazine of Art* for October is a photogravure from "Bo-peep," after Jan Van Beer, whose life and works are the subject of an excellent article. The plate apparently does not suit the method of production, and the finished result is somewhat harsh in contrasts. The same number contains an article on "Burmese Art," and it is curious to examine that nation's ideas upon such myths as the flying dragon, the unicorn, and the sphinx. In an article containing some French pictures, the fulness of feeling of the French artist is faithfully depicted, and should at least teach English artists that the Frenchmen can produce works of art equal to, if not far in advance of the English school. One of the sweetest examples of photogravure is presented by the picture entitled "The Return," after Marcus Stone, R.A., in the November magazine. The November issue is full of interest. The pictures in the British Museum and Leicester Corporation Galleries; "Art in relation to Industry," by Alma Tadema (with an excellent portrait); pen and ink drawing by Harry Furniss (with portrait), and numerous other illustrations, present quite an instructive cycle of art.

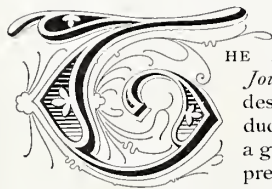
OF *The Art Journal* for October and November, the frontispieces are the main attractions. In the October journal the original etching by Mr. E. Slocombe, of Norwich Cathedral, is rather crisp—perhaps too crisp to be considered a fairly picturesque copy of the soft river and herbage in the vicinity. The distance of the spire should certainly have been given by a more delicate treatment than that which it has received. The November journal contains a fine photogravure from the picture of "Lord Mayor's Day," by Mr. W. Logsdail. The articles and illustrations in the October journal upon "Professor Herkomer's School," "English and American Architecture," "Carpets and Curtains," and the "Isle of Wight," cannot fail to attract more than ordinary attention; whilst the studies from "John Linnell's Country" are at least instructive.

"PRINCIPLES OF ART" is the title of a work originally compiled by Mr. James Ward, of the Macclesfield School of Art, and was recently remodelled by Mr. Aitchison, A.R.A. In criticising this work, *The Art Journal* says, "with more care it might become one of the standard books on the subject"; and in reviewing its contents, writes that it "presents to the untrained ornamentist some idea of the several historic styles of decoration, and at the same time deduces from them the sphere, and—what is equally important—the limits of the proper exercise of the ornamental faculty."

*The Magazine of Art* reminds us that there is a book of equal, if not superior capacity, by M. Henri Mayeux, patronised by the Administration des Beaux Arts, of which students of ornament can obtain an English translation.

IN the *Portfolio* of November is a splendid photogravure from the instructive "study of a lion" by Sir Edwin Landseer. Its usefulness to all draughtsmen cannot be over-estimated.

## Crayon Drawings by the Mezzotint Method.



THE AMERICAN *Lithographers' Journal*, in a concise article, describes the method of producing crayon drawings from a grained stone which has been previously chalked all over to an even degree, in the same

manner that the mezzotinter starts upon a plate abraded evenly, and if printed from would give a soft velvety black.

In introducing the subject, the journal briefly touches upon the very wide range covered by lithography, and recounts the different ways in which every individual—either commercial, artistic, or private—is in some way dependent upon lithography. Thus the geographical, geological, agricultural, botanical, biological, and physiological sciences owe their dissemination throughout the world to lithographic plans, maps, charts, and diagrams, involving skill and workmanship in each branch of their production. The artist can bring lithography to his aid, and can just as faithfully pour forth his genius upon the stone or zinc as he can upon paper and canvas, and through this channel his productions reach the humblest homes instead of giving pleasure to one owner of his works, who keeps the pictures almost inaccessible to the public generally. In commerce, where would the great concerns be without their brilliant wall advertisements, their artistic handbills and inserts, their invoice and memo headings, their labels and tickets. And lastly, but by no means least, the public would be in a miserable inartistic condition without the beautiful coloured plates distributed in multitudes annually by the great periodical-publishing concerns, whilst without the handsome Christmas, New Year, birthday, wedding, and every other kind of card, people would be robbed of an inestimable pleasure the extent of which could never be realised unless such prints were suddenly withdrawn from publication. Such a vast category of the uses of lithography should make the lithographer feel proud of his business, and should fill him with an enthusiasm to aspire to even greater things.

Not only is lithography so far reaching in its applications, but its modes of treatment are so varied as to tax the best draughtsmen to become accomplished in all its details, and among its many by-ways not the least interesting is the production of drawings from a grained stone, previously worked in almost solid black. The description of the details of this process will at once make clear the meaning of working the grain so as to give a black, before clearing it, and for this purpose the tools used are:—the flannel, the grainer, the boxwood or ivory points, and the scraper or mezzotint knife.

As usual, the drawing to be executed is traced upon the stone, or a transfer is put down from the keystone. The work is outlined with drawing ink, and can then

be scraped or cut up with the knife, so that it will not appear harsh against the tints of which it forms the boundary or silhouette. If the final tinting is only very light or thin, the ordinary red chalk tracing or offset will be found a quite sufficient guide without outlining it with ink. In any case the outline must not be lost sight of; and if the drawing is intended to be worked up in broad and dark tints it is better to make the first tracing only sufficient to give the boundaries of such gradations of tints, and when the tints have been fairly worked in, a second tracing should be made of the outlines and finer details. Having carried out either of these plans the drawing should be scrutinised, and an estimate made of the relative strengths of the tints. It will be found that about four tints will be all that are necessary to produce the main body tints, and the next point is to commence tinting in the lightest tints wherever they may occur, with a soft crayon. The crayon must be well worked into the grain rather than upon the points of the grain, and must be well worked up to the boundary lines of such tints. Then commence to rub the tint out with strips of flannel about half an inch wide. Place one finger on the flannel and start at the boundary of the tint by drawing it inwards towards the centre of the tinted surface, thus wiping the crayon out of the grain and gradually lightening it to the required degree. Always work over the tint and avoid rubbing the clean stone or it will also become tinted before it is required. A fair amount of pressure is necessary, which will be readily learnt by experience; over-pressure will force the crayon into the stone. Again, in tinting the stone previous to wiping out, it should not be done too long beforehand, or the crayon will have permanently greased the stone and cannot be wiped out. The wiping out with flannel requires just a moderate exercise of discretion. The flannel should be constantly moved over the finger to present a clear surface, for the cleaner the surface the more readily will it wipe the crayon out. The size of flannel can be adjusted to the size of the areas of tints. Thus, large surfaces can be worked with folded flannel and the pressure of the whole hand applied. In like manner the second tints are worked in with a harder crayon and wiped out with flannel, and the darker tints are successively added. The main precautions in using the flannel in rubbing are to rub from the light tints to the darker ones, thus avoiding passing over the lighter tints already formed and soiling them.

The main tints being completed, heavy tints can be put upon any of them by using harder crayons than they were produced with, and rubbing them down with the flannel. On the contrary, to produce almost clear lights paint them with water, and after a little soaking, press clean linen upon them and remove the softened crayon.

The final touches of outlines and flat tints can be worked in with ink and crayons No. 2 and 3, whilst light points can be picked out with the pickers, and smart touches of light scraped with the mezzotint knife. If shades are deepened by second and third rubbed tints upon them it increases the difficulty of printing, although it is employed successfully to produce the most delicate tints.



Although the foregoing process is very complete and may lead to some high-class results, yet in the main there is nothing to recommend it before the well-known and oft-used practice of rubbing tints in directly by dipping a flannel or leather in chalk parings and rubbing the tints as required, without first chalking the stone in. And the resemblance of the process to mezzotinting is more by comparison than actual reality, though it is perhaps the nearest stone process to the mellow productions from the mezzotint plate.

## Spoiled Work Restored.

AN OLD WRINKLE REVIVED.



OW often is work on a stone, in the press or machine, apparently spoiled by the unintentional use of an acid sponge. It is not an everyday occurrence, in fact it does not pay to be quite so frequent, yet it does often occur, and the general remedy is that a large amount of "doctoring," or repairing, has to take place, or a new transfer has to be put down. Strange to say, neither of these expedients is really necessary, nor are they economical. Doctoring seldom proves successful, and repairing is difficult, as well as liable not to hold, especially if the damage has been done with oxalic acid, or the stone prepared with acetic acid. No! the work on the stone is not spoiled. It is there as perfect as ever if it is only uncovered in the proper way. It may seem curious to make such a statement, but it is borne out by facts. Only the other day a sheet of some fifty odd labels had just been transferred and put into the machine. The work was going forward all right, when one of those accidents happened over which human nature has little control. The machine minder, in using the oxalic acid sponge for the edges, slipped and drew the sponge over seven of the labels, apparently spoiling them beyond repair. The foreman took the matter in hand, and tried every means of doctoring which he knew, but with only one result, viz., after getting the tickets up sound, the first run took all the ink off and left them bare again. Seeing that doctoring was not any good, especially after the oxalic acid had glazed the surface to an appreciable extent, it all at once flashed across the foreman's mind to use an old wrinkle, which he had only the night before been reminded of by our assistant editor. No sooner thought of than done. He took a piece of polishing stone and polished out the whole seven damaged tickets. He used perfectly clean water, and did not allow gum or acid to touch the surface. Having polished the tickets out, he took a good rubbing-up rag, and rapidly rubbed the vanished tickets up again as fresh as new transfers. This not only restored the work required, but brought back some figures which had previously been etched out with polishing stone and acid.

Readers may be apt to say this was one instance in a hundred in which the same treatment might prove successful, but they may rest assured this is not so. After the stone referred to was set going in the machine, the foreman turned his attention to several

other stones, and indiscriminately polished the whole surface of the stone, sometimes destroying work with oxalic, acetic, and nitric acids, and even polishing out by using nitric acid and polishing stone. But in each case the result was the same, for after again polishing the stone, the work was readily rubbed up again and left in a cleaner condition than at first. In one case the work had been purposely polished from a stone fifteen months ago, yet by again polishing, and re-polishing and rubbing up, the work was very largely restored.

So certain is the process, that no printer need fear to use it to any extent. It does not matter whether the work be new or old, the result is the same. The first instance quoted was that of a new transfer, and amply proved the case.

When, for instance, an order has been run for a large number of impressions, the work begins to look worn out, and the stone has a glazed and dirty surface from the constant application of gum or acid. To restore this stone and the work thereon, it should be uniformly polished all over, until the ink has been all cleared off or even lower. Then it will roll or rub up equal to new. The only other way to secure anything like the same result is to use lithophile, but that does not revive the surface of the stone like polishing, nor could it be expected to reach the work after damage by acid.

ALREADY letters have appeared in the newspapers calling attention to the fact that the Christmas supplements of the different illustrated journals and periodicals are once more being printed abroad, to the manifest detriment of the lithographic industry in London during what ought to be the busiest season of the year. From my personal knowledge, says "Dogberry," in the *City Press*, there is only too much truth in these complaints; therefore, whenever an instance to the contrary comes before my notice, I consider it nothing but fair to draw public attention to it. The advance specimens of four exquisitely coloured plates intended to be issued as gratis supplements to the forthcoming "Pears' Annual" now lie on my desk, and each, I am informed by the imprint, has been "printed in England." I will merely express a hope that when, in due course, the other specimens come to hand, I shall be none the less gratified in this respect on their account. The prevalent idea that Continental colour printing is either superior to or cheaper than that produced by our own workmen is altogether a myth, I might say, "a delusion and a snare."

A METHOD of "producing coloured photographs" has been patented in this country by Mr. J. W. McDonough, of Chicago, which consists in dusting a varnished plate with coloured particles, and then applying a sensitive compound to them. The patentee says that the process of producing the effect called colour is by absorption of light, but as colour effects may be produced by refraction, dispersion, or diffraction of light, he does not limit himself to absorption only. The specification is numbered 5597 of this year.



The advertisement is framed by a decorative border. At the top, a woman with long, wavy blonde hair and a green leafy crown is depicted within a golden circular halo. To her right, a bunch of green grapes hangs from a vine with large, serrated leaves. A horizontal banner with a red and white striped border contains the text "A.B. FLEMING & CO. LTD." in white, serif, all-caps font. Below the banner, the text "Scottish Printing Ink Factory." is written in a large, black, cursive script. Underneath this, "Caroline Park, EDINBURGH." is written in a smaller, red, cursive script. Further down, "AND 15, Whitefriars Street, LONDON. E.C." is printed in a black, serif, all-caps font. At the bottom, the text "The Largest Printing Ink Factory in the World." is written in a black, serif, all-caps font. The background of the advertisement is a light cream color with a subtle, repeating pattern of small blue flowers and green leaves.

A.B. FLEMING & CO. LTD.

Scottish  
Printing Ink  
Factory.

Caroline Park,  
EDINBURGH.

AND  
15, Whitefriars Street,  
LONDON. E.C.

The Largest Printing Ink Factory  
in the World.

DE MONT. & CO. PRESS LITHG.

LEEDS. & CO. & CO. & CO. & CO.

Printed with A.B. Fleming & Co's Inks

PRINTED ON PAPER SUPPLIED BY THE WELL-KNOWN  
Chromo-Enamel Manufacturers.

Messrs. SMITH & McLAURIN, Johnstone, Scotland





...

AGAIN the world of paper is flooded with an innumerable tide of coloured supplements to all the leading and minor periodicals.

There are perhaps few who will not agree with us in saying that this year's show is scarcely comparable with the works of last year. Some journals, it is true, have improved very largely in the choice of their subjects, although perhaps the treatment may not be any better. As an instance of this improvement, *Black and White* has favoured us with an excellent production of "Nobody asked you, Sir, she said," which is perhaps the most fascinating plate of the year, and will gain a popularity far in excess of its last year's plate, "Mrs. Siddons." *The Ladies' Pictorial* has again brought forth a charming picture, apparently of foreign origin, delicately treated and full of well-blended colouring. It is remarkable that for four years at least in succession this journal has retained its popular standard in its Christmas plates, whilst many others have been beating about amongst executions of various degrees of taste. *The Sporting and Dramatic* has also retained its level—however high or low in the scale it may be considered—with another of those peculiarly æsthetic subjects, entitled, "Bonny Kate," which is a companion picture to last year's supplement. But the journals of the year from whom we anticipate so much have not realised our expectations. The plates presented with the *Illustrated London News* cannot by any means be placed in the same rank as their memorable picture of last year, "The Rival Belles." Of the three plates, the best is undoubtedly the "Huntsman and Child," with its bright colouring and lively expression. The "Boatman and Child" seems to be very familiar, and there is nothing out of the ordinary in its production; whilst the gracefully dressed little French figure is really pretty, but it has already been somewhat overdone in advertising grooves and does not attract the eye as a novelty.

The picture of *The Graphic*—"A Lucky Dog"—certainly looks much better at a little distance than closer to, where the network of the colour blocks becomes apparent and lends anything but a decent finish to a subject which, from its very character, requires smoothness. The chromotypography process is improving slightly, but one cannot imagine that *The Graphic* really considered it *par excellence* for chromo productions, and we can only think that they have tried it as an experiment. The other coloured plate—a party out for a drive—is more adapted to this process, and with its nice bit of colour makes a fair picture. Both, however, seem to fail

in that soft depth which characterises well-finished chromos. The third plate in tints is a very good subject, and the treatment seems to suit it admirably.

*Pen and Pencil* publishes two bright chromos—"Hope's Fairest Promise" and "Love's Fairest Dream"—both of which are the busts of females, partially reclining with the arms upon pillows and the faces almost resting on the arms. Time may mellow down the brilliance of the colouring and convert them into sober oil paintings, when they will not fail to be attractive.

*Father Christmas* again brings forth one of those pictures of a child in the awkward predicament of carrying a goose, the rendering of which is very fair, although it is somewhat flat. Both this Christmas number and *Yule Tide* have quite changed their style of supplements in the past few years, and do not seem to have improved at all. The plate presented with the latter is a very peculiar subject, entitled, "Rose, Shamrock, and Thistle." What the publishers expected its charm would be is very difficult to determine. In production, it is flat; in colouring, low; and the figures are simply lifeless. The original painting is by Mr. C. W. Joy, and in its general appearance is like Dante Rossetti's "Rosa Triplex." It may be an imitation of Rossetti's style, but for all that, neither it nor "Rosa Triplex" are likely to catch the popular eye. The plate, however, is somewhat better chosen than last year's painful subject from the Crimea.

In marked contrast is the romping plate given with *Chatterbox*, entitled, "A Christmas Raid," full of merit, mirth, and good execution.

One of the disappointments of the season is *Pears' Annual*. It is only natural to suppose that such a firm could have had at its command the finest pictures of the day, yet they choose to publish as their first plate the subject of "Curiosity," in which two short-skirted women are mounting a ladder to peep over a wall. Of the other three plates, very little can be said. "Pluck" is a nice but unattractive plate, whilst the "Christmas Dinner Table," with its customary toast, has been so oft produced that it needs to be a very good thing to again excite much attention. The fourth plate is simply a copy of the "Dirty Boy" model.

Weldon's publications again present a set of four respectable plates. *The Ladies' Journal*, with its picture "Engaged," after J. B. Kennington, is executed altogether too heavy and unnatural in colours, whilst the features of the ladies are much too thick. The second plate is an accident of "Spilt Milk," which in colour and drawing is good. *The Children's Bazaar* plate is "Sweep your Snow Away," which, though pretty, does not equal last year's plate. The plate of "Good Night, Mamma," with *The Illustrated Dressmaker*, is full of colour and feeling—perhaps a little too much colour; and the mamma is depicted as possessing a very girlish face.

"The Mistletoe Bough" is again produced, this time by *The Young Ladies' Journal*, and is far in advance of last year's plate. The treatment of colour is good, and the drawing needs very little improvement to make it a smart little picture.



Of *Myra's Journal* plate "Choir Practice," and *Sylvia's Journal* "The Little Culprits," very little can be said, they are so peculiarly unattractive. Whilst the misty production upon satin with *The Gentlewoman* is equally hard to praise.

With Horner's penny stories Christmas number is a pretty plate, entitled "Good-bye, Dear Heart"; and with the *Capital and Labour Clothing Association Annual* is issued a picturesque chromotypogravure, entitled "Gossiping"—of course two women—and a splendid little panel picture in black and white, having as its subject, "Sent out for Punishment."

*The Penny Illustrated Paper* has this year certainly shewn its good taste in the excellent production of the subject, "Playmates." The execution is quite refreshing and carries with it all the character of a good painting.

*The Queen* again publishes a copy of one of Davidson Knowles' pictures—"School Days"—which, however full of artistic merit it may be, does not make a very attractive picture. The second plate, after C. Haigh Wood, entitled "What Shall I Say?" is not a badly chosen subject, and if more attention had been bestowed upon the flesh colours, would have made quite a good thing.

The supplement to *Hearth and Home* is a lovely photogravure plate, rich in its intense depths without destruction of detail.

*The Art Journal*, in continuation of its *Art Annuals*, has this year chosen the life and works of Mr. Herbert Herkomer, R.A., as its subject. The work as usual is fully illustrated by many well known examples from his excellent productions, and is itself a small art gallery. The principal plate is a delightful rendering of the Greenwich pensioners.

This year the *Magazine of Art* has gone in for an annual, consisting of some fifteen hundred illustrations taken from Continental pictures of this year. It is undoubtedly a step towards teaching English artists what the foreigners can produce.

Altogether, we are apt to think that although the Christmas annuals will be run after in the usual head-long manner, yet, unless their contents are far more interesting than the coloured plates, they may be considered anything but a success.

At the Camera Club, Charing Cross-road, an exhibition of artistic photographs was opened on the 18th inst., and will remain open until December 8th. It is free to visitors from 10 to 12 in the morning, and from 2 to 4 in the afternoon, on presentation of cards, to be obtained from exhibitors, from members, or the hon. sec. The exhibition consists of direct photographs selected from those produced during the year.

MR. DANDO, at the last meeting of the L. and P.P.A., stated that he had obtained to a certain extent natural colours in lantern slides by passing a band of coloured light through the camera during exposure; and, in conclusion, expressed a hope that "some of you scientific gents would continue the experiment." Here's a chance for somebody.



## Technical Classes.

### LEICESTER.



THE PRESENTATION OF PRIZES of the litho class took place on Saturday, November 19, at the Masonic Hall, Halford-street. Tea was provided at six p.m., and was attended by a large and representative gathering of the members of the class and lithographic employers of the town. After tea, Mr. W. H. Lead, chairman of the committee—who was supported by Mr. E. Shardlow, Mr. H. Humphreys (Fleming & Co.), Mr. J. C. Lawrence (Raithby, Lawrence & Co., Limited), Mr. S. D. Hall (the teacher), and others—distributed the prizes and certificates given by the City and Guilds of London Institute and the local committee. They included fourteen second-class ordinary certificates, eight first-class, fifteen prizes for attendance, eight for answers to test questions, and Senefelder portraits to those who had attended class regularly. Mr. R. E. Walton obtained a second prize of £1 and a bronze medal, and Mr. C. W. Kilby and Mr. J. R. Ellwood received first-class honours, the former also receiving the silver medal and a prize of £2.

Mr. Lead gave an outline of the efforts which resulted in the formation of the class—the first connected with the trade in the town. From the time of its first mention and the initial efforts of Mr. Kilby, which resulted in the meeting of the employers and employes and the formation of a joint committee, the class had been throughout and finally a success. Twenty-seven presented themselves for examination, and there were only three failures—a result creditable both to teacher and students. Speaking more particularly of the value of the examination, he said that it was a discipline which showed exactly what a man really knew, those who failed to pass were not by any means disgraced, and he trusted they would not be disheartened, but try again. Speaking of the future, it never was intended that technical education should take the place of practical work, as that could not fail to injure the trade. Some more than others needed this instruction, according to their natural abilities, but both the students and their employers could not fail to benefit by the attention to the theory acquired. Emphasising the fact, he urged, that the receipt of prizes was not the end of their education; in fact, it had only just begun, as it was necessary for the student to apply the knowledge

practically for himself. Reverting to the condition of trade in general, he pointed out that only the best men could expect to be constantly successful in their calling, and the proper use of the information they had received would assist them to keep their standing and improve themselves in the various departments of the work. Leicester was still somewhat behind other centres in the quality of its productions, and it was their duty both to themselves and the town to raise the standard of its lithographic work. With regard to the often-heard "you're another" spirit, he hoped that the distribution of knowledge would obviate this, and that a general give-and-take between the various departments would tend both to increase the quality of the work and the comfort of the workers.

Mr. J. C. Lawrence expressed his satisfaction at the results of the examination, and heartily concurred in the opinions of Mr. Lead as to the high value of the training received, and more especially as to the necessity for the after practical application. Examinations were all very well, and technical knowledge was all very well, but it must be applied to be of real use. He urged upon the student the need of keeping abreast of the times in the matter of education, and of steady application. The best motto nowadays was "progress." Eulogising the work of the instructor, Mr. Hall, he moved that the best thanks of the committee and the members of the class be tendered to that gentleman for the very efficient manner in which he had conducted the class.

Mr. Shardlow briefly seconded the resolution, believing Mr. Hall well worthy of the best thanks of students and employers alike.

Mr. Broughton and Mr. Keightley supported the motion, and it was passed with acclamation.

Replying, Mr. Hall thanked the committee for the assistance they had rendered in so many ways. He was gratified at the result of the examination, and more than pleased with the manner in which work had been done during the session. Reviewing the progress of the work, he said he had endeavoured to make it as practical as possible, and to fit them for the duties they were called upon to perform in their daily work. He had learnt much from contact with the students, and in meeting the difficulties which were from time to time brought before him. While the three R's were perhaps more applicable to the letterpress printer, he would ask for their attention to the three P's of principles, practice, and perseverance, which, when properly carried out, were certain aids to success.

Mr. G. A. Goodwin, in a capital little speech, moved that the best thanks of the meeting be tendered to the chairman, Mr. W. H. Lead, for his several valuable services in connection with the class meetings, the distribution of the prizes, and for his generosity in providing the opportunity for thus meeting together, and by inviting those present to such a substantial tea and pleasant evening.

This was seconded by Mr. C. W. Kilby, who acknowledged the work of Mr. Lead in connection with the formation and the after arrangements of the class.

Mr. Lead briefly replied, and hoped the occasion was only one of a number of such pleasant gatherings.

Mr. Hall proposed and Mr. Langton seconded a vote of thanks to the hon. sec., Mr. T. B. Widdowson, who, in reply, showed that the class had been more than ordinarily successful. Eleven first-class ordinary grade and five in honours had been earned. And while the percentage of failures for the whole of England was 22.5, this class was represented by only ten per cent. of failures, and Mr. Hall's classes had taken the whole of the medals given in the subject.

The latter part of the proceedings took the form of a most enjoyable smoking concert, the members showing themselves equally distinguished in music as in class work. Under the genial presidency of Mr. Lead, some capital songs were rendered by Messrs. Stevenson, H. Readings, A. Yates, Allen, F. G. Swift, F. Thomas, S. Langton, and J. O'Donnell. Mr. J. Johnson excelled in a violin solo, and Mr. G. A. Goodwin gave a couple of recitations in his usual excellent style. Mr. S. Dewson, organist at Belgrave Parish Church, rendered efficient service as accompanist. Some splendid specimens of work, representing the latest developments of collotype, chromo, and tint work, were exhibited in the room.

#### LIVERPOOL.

At this class, held at the New Central Buildings, Islington-flags, and conducted by Mr. J. Honeyman (first prizeman and silver medallist), it is announced that, in addition to the regular course of lithography, there will be four special lectures by Mr. W. T. Wilkinson, Manchester, author of "Photo-Engraving," etc., on "Photo-Zinco in Line," "Photo-Zinco in Half-tone," "Photo-Lithography in Line and Half-tone," and "Collotype." We notice also that the class in photography, at the same school, deals extensively with matters useful to the lithographer and the letterpress illustration printer, as will be seen by the following syllabus:—

Early discoveries; daguerreotype, calotype, and wax paper processes; theory of the image and development; collodion, albumen, and other processes; positives and negatives; physical and chemical development.

Modern processes—Collodio-bromide emulsion for wet or dry plates; washed emulsion; gelatine emulsions; variations in emulsions for different purposes; slow or rapid method of making each; preparation of dry plates; emulsion for lantern slides by development or by printing out; methods of intensification; printing processes; plain and albumenised paper, sensitising, printing, and toning—chemistry of the process; platinum printing; other methods of printing in iron, copper, chromium, etc.; carbon printing; printing in various pigments for special purposes; copying and enlarging processes; optics; light; defects in lenses, how remedied; to choose and test a lens; applications of photography to the arts and sciences; photography and the microscope; astronomical photography; photography and the printing press; collotype; photo-lithography; photo-zincography; printing in relief; photo-typography; Woodburytype, etc.; photography and colour; isochromatic plates. Written examination on Wednesday, May 3rd, 7 to 10 p.m.

Practical parts of examination on Saturday, May 13th, between 2 and 7 p.m.

#### MANCHESTER.

THIS year the session has opened in its usual way, and it is to be supported by four separate series of lectures on photography and the photo-mechanical processes. Each series will consist of twelve lectures in the two branches, the twelve lectures being repeated after Christmas.



## The Printing and Allied Trades Exhibition and Market.



HIS Second Annual Exhibition, held in the Agricultural Hall, London, from September 20th to October 1st, inclusive, if we may judge by our visit, was not up to the standard of last year, and if the attendance has

been represented by the mere handful of visitors we saw, then it has been a poor show indeed. We are glad to hear that the promoters have taken warning and decided not to have another exhibition till '95. Once in five years is quite often enough to keep up the interest as regards the progress of printing and printing appliances.

The arrangements for the exhibition were certainly up to the mark. Good light, plenty of space, and well-judged display. Naturally, some of the exhibitors were in the shade under the galleries, and there was a feeling of "lostness" owing to the fewness of the exhibits. To the lithographer this was painfully apparent, and his whole attention could be centred in half-a-dozen exhibits without troubling to even look at the remaining 100 displays.

Gas engines have become a standard commodity to the printer, and they were represented by most of the well-known makers, including Crossley, Tangyes, the Stockport, the Trent, Furnival, and Weyman & Hitchcock.

Letterpress machinery and paper making received a moderate amount of attention by exhibits. In fact, the stand of the *Paper Maker* was full of interesting items, including varieties of paper, photographs from improved paper machinery, boards, tissues, balances, strainers, and excellent models of dandy rolls and watermarks.

The letterpress exhibit which touched most closely the lithographic mind was that by Dalziel of *Sloper* fame. Here were to be seen hard metal stereotypes, executed in the course of an hour, from the finest process blocks. Samples of printing from the blocks were on the stand, and to the ordinary observer, very little difference could be seen in the stereotypes from the fine wood blocks and process productions produced without the intermediate electrolyte.

In the bookbinding section and general paper-cutting and finishing, the machinery by Kampe & Co. was well worth the printers' scrutiny.

In lithographic machines there were just three exhibitors, viz., Newsum, Wood, Dyson & Co.; Seggie & Son; and Ratcliff & Sons. The "Newsum" machine was fitted with a flyer and self-acting apparatus. The latter consists of a water trough with metallic roller in it, from which the water is taken by occasional contact of a covered roller; this in turn imparts the moisture at intervals to the back damping roller, just behind the cylinder. The contrivance is similar to the ink duct, but is most unfortunately placed just behind

the cylinder in the usual position of the dampers. In Ratcliff's machine—which is also fitted with flyers—an improved damping apparatus is fitted up under the back-board. It is a trough and carrier roller, which damps the damping table. In Seggie's machine the damping apparatus consists of a water trough attached to the back of the damping table and travels with it. The roller in the trough damps a roller under the back-board, and that in turn damps the damping table.

Seggie's machine was printing bronze work at 700 per hour, and a Silverlock's bronzer was working with it at the same speed. Newsum's machine was also working in conjunction with a Newsum's patent bronzer. The exhibition of these two bronzers gave rise to a spirited cross-fire between the respective patentees.

After the machinery, the only remaining exhibits which bear any interest to the lithographer were the inks, Christmas cards, calendars, booklets, etc., and the mechanical aids to lithographic production under the direct control of the draughtsman's hand.

The stand of Messrs. Otto König & Co. bristled with interest. There could be seen samples of excellent colour work printed from zinc plates (from F. Krebs, Frankfort-on-Main), the plates themselves being on view. These plates are much the same as others in the market, having the dull grey tone which militates against both artist and printer, yet the prints are first-rate, and the whole stand is decorated with machine copies of innumerable productions from zinc. Unfortunately, the transmission of goods *via* Hamburg being at present slow, the stand was at a disadvantage in not having there a "Universal" tool for planing and cutting zinc and wood; also a pantograph for reducing or enlarging colour work. A sample of the latter (if executed by this machine) on the stand was a marvellously fine reproduction in fourteen colours. However, the absence of this latter instrument was in a degree compensated for by the exhibition of two stone-engraving machines, one of which is adapted for straight line work and the other for the curved, crenated or wavy, and zig-zag line-work so common in cheques. This latter machine is capable of all the intricate "engine turnings" which decorate silver and gold articles, and is applicable to stone or plate. It is worked much the same as a straight-line ruling machine as regards its travelling gear, but the character of the line is governed by a key-wheel. There are many different key-wheels, each of which may be put on in turn. The key-wheel transmits its shape through a steel piece, flattened like a screw-driver, which works vertically against it. This vertical motion is converted into a transverse motion, which causes the headstock containing the diamond to oscillate to and fro in exact repetition of the form of the key-wheel. Examples of the work of both machines go far to prove that the elaborate note headings which come from America and Germany are the result of stone engraving rather than plate engravings, as is generally supposed.

Last, but by no means least, is the simple lightning stippler. Here is a machine which the merest tyro can handle, producing accurate stipple dots at the rate of 2,000 per minute, or ten times the number



Supplement to the "British Lithographer"  
Printed on Grosvenor. Chater & Co. "Acme" Printing Paper.

D. B. Main & Co.  
Limited,  
Manufacturers of Electro Plate,  
By appointment to  
Her Majesty the Queen,  
29, Doregall Road,  
London.

First Prize. Litho Writers' Competition.

AWARDED TO

Alf. S. Farrell, Battersea, London.

Dr. Moffat Press Litho



produced by the hand. Like everything else, it wants a little practice; but the sample of a nine-colour calendar, of which our representative examined one well-worked stone, goes far to prove that any draughtsman can soon adapt himself to use this mechanical aid in cheapening the production of the stipple work. It is not claimed that the machine can supersede the hand, but is rather a supplement. Large areas of background, drapery, etc., can be readily worked out. In fact, at the very least, two-thirds of every colour stone can be done in one-quarter the time that is now required by hand. One advantage is that the machine requires a good stiff ink, and work executed by it cannot possibly go wrong in the printing. Further, the machine can be readily fitted with different needles, thus producing different degrees of fineness in stippling, and by simply crossing and recrossing the dotting a grain is produced in a few minutes, where hours are now exhausted in working up close gradations.

In closing our remarks, we candidly hope that the next exhibition may be fraught with a greater success in respect of the capabilities of the great printing and kindred trades.

## Lithographic Embossing.

**L**ITHOGRAPHERS well know the occasional value of a good piece of embossed work, and it is only the large expenditure necessary for the purchase of embossing rollers and machines which deters many from doing a large amount of this class of work. This cost has turned attention to a method of producing the same effect by means of the stone on the hand-press, and though the results are not exactly equal to those produced by the special machines and rollers, yet some very good work is produced by the cheaper agency, that of obtaining the canvas effect for chromos being very popular, and it is within the range of probability that the method may be much improved upon ere long. The *Freie Kunst* says that embossing by means of the stone offers a special advantage, as, with the assistance of the transfer, the embossed plate may be multiplied as often as the work requires. The embossed gold leaf effect in a label is obtained in the following way:—The label must be an engraving or pen and ink work. A transfer is made of the engraving, and from this a proof is pulled. From this original transfer another transfer is made upon a thick stone for the embossing, and this is repeated as often as the edition requires. Now the transfer for the gold may be made, and it may be filled out with due regard to the embossing. The register marks must be given especial attention to. After this the transfer is made as strong as possible and prepared for high etching; it is dusted with resin and etched weakly or strongly according to the quality of the drawing until it is sufficiently high for the embossing. The register marks must likewise be etched, and the points drilled with stick-up needles.

The printing in gold is done in the usual way. If it be desired to emboss the prints they must be very well dried, and then proceed as follows:—As backing-sheet, a piece of tin-plate of about a millimetre in thickness is used. In place of a matrice blotting paper is used. If the stone is etched high, the impression is placed with that side upon the stone which has not been printed upon, at the same time being very attentive to the register marks. Now several sheets of blotting paper are placed upon the printed side, on top of this the tin backing-sheet, and it should then be pulled through with strong pressure. According to the depth of the embossing desired more or less blotting paper must be applied. If the paper is especially hard the stone should be moistened, or, if the quality of the work permits it, the impressions may be kept for a while in a cellar previous to embossing them. They should, however, not be spread out, but be placed in a pile on a board. In case of a label, script and border of which is to be printed in black, while the tint contains an embossed coat of arms, or a crown, or any similar object, special care is required, because in such a case the embossing is etched deep. If the object and edition is small, we recommend the following:—The border and the lettering are engraved, while of the design to be embossed only the outlines are to appear, and from this an original transfer is made. A second stone is now coated with asphaltum, and a transfer from the first stone is made on the asphaltum, and this is dusted with gold bronze so as to make all the details appear distinctly. The asphaltum is scraped off with the exception of those places where the embossing is to be, and the design to be embossed is then engraved through the asphaltum. The places which are intended to be very prominent must be engraved deeper. The superfluous asphaltum at the edges is ground away, and the plate may now be etched without difficulty, and rolled up without cleaning the asphaltum by means of turpentine. It is now possible to judge whether the engraving has been done correctly; if not it may be easily improved upon. If this has been done, the stone is rolled up and dusted with resin to avoid the damaging of the design through the etching. For better protection very fine work should be stopped out. The design to be embossed will now appear etched deep, and the bordering and lettering etched high. The printing is done in the following way:—Paying particular attention to the register marks mentioned above, the black stone is printed in the customary way. The tint is likewise treated in the usual manner, and for the purpose of embossing blotting paper is used more or less according to the depth of the embossing required. If the embossed design is not prominent enough, a dampened sheet of paper is placed upon the impression before pulling through, which will remedy the defect.

MR. B. HOWARD MANDER, of Messrs. Mander Bros., Wolverhampton, was married on October 26th to Miss Lilian Nelson, daughter of Mr. G. H. Nelson, of Rowsham Park, Oxford. Included among the wedding presents was a silver tea and coffee service, accompanied with an illuminated address, from the employes of the firm in Wolverhampton and London.



## Trade Reports.

(From our Special Correspondents.)

### LONDON.



HERE are already upwards of 170 members in the London Society of Lithographic Stone Preparers. There are only about 250 in the whole industry in London. They have drawn up a uniform rate of wages, and have asked the employers to pay it. Some, writes the secretary, have done so, but many have refused; and the wages paid in these cases are as low as 16/- a week. In one case, as soon as the man asked for more money he was discharged, and a boy taken on at 12/- per week. The work requires considerable judgment and tact, and is very laborious. Numbers of members have been injured for life by lifting stones weighing five or six hundredweight. Since the formation of the society wages have gone up in a number of cases, the rate agreed upon being 25/- a week. At Messrs. Goodall's and Causton and Sons' they have been received kindly by the employers, and the union rate of wages was paid. But in another case six men were told that unless they signed an agreement not to join any union they would have to leave work. Three refused to do so, and were in consequence discharged. The others having signed were allowed to continue at work.

### LIVERPOOL.

BUSINESS here is reported dull, though one or two firms have been working overtime during the past two months.

THE litho technical class, conducted by Mr. J. Honeyman, recommenced on the evening of Tuesday, October 6th, sixteen students being enrolled. In connexion with this class, arrangements have been made with Mr. Wilkinson, of Manchester, for a series of lectures on photo-litho and other processes allied thereto, which will be open to the trade for a small fee. This is a good idea, and we hope to see it extended.

### LEEDS.

AT the technical class at the Leeds School of Art, an addition is being made to the facilities offered to young men engaged in the lithographic business. It was felt that the studies of young apprentices would be more directly useful if some of the advantages of the workroom could be brought into the school, so that the instruction should take as practical a direction as possible. At present, every facility is given for studying figure and design, and there is now added a printing press and all necessary materials. From time to time it is intended that, as pupils execute satisfactory original work, demonstrations shall be given in the printing of various kinds of black and white by a competent man; and should the class meet with the encouragement of masters and apprentices, it is hoped that still further developments may be made. Mr. George Suddick, of the firm of Goodall and Suddick, has taken a great interest in the scheme since the suggestion was made, and has offered to give prizes to deserving pupils, believing that the class will benefit the trade.

### EDINBURGH.

TRADE has been exceedingly quiet in Edinburgh for the past few months, but it is now taking a turn again, and by the time these notes meet the reader's eye, we shall probably be as busy as is usually the case during the last quarter of the year.

MESSRS. BANKS & CO., a firm whose reputation is not confined to this side of the border, are making extensive additions to their already large works, in order to meet the growing demands of their business; and the increased facilities this firm will shortly have at their command will make their lithographic establishment the largest in the East of Scotland.

EDINBURGH has a world-wide fame for its educational institutions. The Heriot-Watt College has classes for almost all the principal trades, yet there is none for lithography. Even in our free library, which is one of the best in the kingdom, there are not half a dozen manuals on the art, and these are mostly old fashioned and of little practical service to anyone consulting them. By and bye the trade here must awake and realise the necessity for some higher instruction than is afforded in the daily routine of the workshop; meanwhile the practical papers in the B.L. are a godsend.—J.B.

### DERBY.

BUSINESS very quiet in lithography, but good in collotype. We have had no members unemployed during the last month. Pending alterations at the Municipal Technical College, the lithographic technical classes, conducted by Mr. S. D. Hall, will be held at the Central Board School, Abbey-street. The session commenced on Monday evening, October 3rd, at 7-30. The classes are free.—W.C.

### MAIDSTONE.

THE litho business here is somewhat dull, and several of Messrs. Hobbs & Sons' employes have recently left for "fresh fields and pastures new." A smoking concert was held at the West Kent Hotel, on October 27th, on the occasion of Mr. A. Richards, who has for many years been known and greatly respected among his fellow workmen, now leaving the town. Mr. H. Gilbert presided. During the evening suitable songs and recitations were given, and one and all wished Mr. Richards every success in his new undertaking.

TECHNICAL INSTRUCTION.—At the Borough Road Polytechnic Institute, Mr. Howard Farmer is announced to give a course of practical instruction in the principal photographic processes. At the Regent Street Polytechnic, Mr. Chas. Whiting (one of the few wet collodion veterans) will lecture on the wet collodion process for photo mechanical work, copying, etc.; Mr. Howard Farmer, on photogravure; Mr. George Holzhausen, on collotype. Photo-lithography and zincography are included, but no lecturer's name is given for these subjects. The above courses are a new departure, and it is hoped that all will fill. They are calculated to raise the envy of the mere provincial who cannot get such chances as are to be had in the metropolis.—*Printing Times and Lithographer.*

## Commemoration Dinner at Nottingham.



Friday, November 18th, the members of the Nottingham Branch of the Amalgamated Lithographic Artists' Society had a dinner to commemorate the completion of the seventh year of the existence of that branch, which was an accomplished fact on Wednesday, November 16th. The programme of the evening consisted of an excellent dinner, served in the usual first-rate style so well known at the "Black Swan," Goose-gate, Nottingham; after which the time was spent as a musical evening, interspersed with a few toasts appropriate to the occasion. The chairman, Mr. W. F. Myatt, in opening the after proceedings, congratulated the branch on the completion of its first seven years, and trusted the work accomplished would now receive an additional impetus from this fact, and would be greatly augmented in the future. The first toast on the list was "The Society," proposed by Mr. Caldicott, who, in a few effective remarks, shewed that the time had arrived when the Society was of great advantage to the employers, since it now contained the very pick of the profession throughout the country, and he trusted that in the near future advertisements by firms would be concluded by the words "Society preferred." Mr. Harrap, the general secretary (Manchester), in responding, fully endorsed the opinion expressed by the mover of the toast; and in referring to the commencement of the Society on September 26th, 1885, shewed how the number of members had increased to its present total of about five hundred, embracing nearly the whole available talent. He quoted a number of figures shewing the income and accumulated funds of the Society, and pointed out that in six and a half years nearly £1,000 had been paid in benefits to the members. He spoke in terms of the highest praise of the action taken by the cotton operatives in the present struggle, and said, should necessity require, the members of our own Society would not be averse to paying 5/3 per week, as the cotton spinners are now doing, to prevent an unjustifiable aggression by employers. He further argued that, as business stood at present, a reduction of the working hours would be the only remedy against the constant overstocking of the professions with increased producers; and he emphasised the fact that the monotony and tedium of the business, coupled with the constant exercise of considerable skill, required this reduction of hours in the interests of those employed, as well as the prosperity of the artistic branch of printing in this country. In reviewing the attitude of trade unionists generally, he strongly urged those present to support the only real labour paper at present published, namely, *The Workmen's Times*. In touching upon productive co-operation, he impressed the opinion that trade unionism to be effective must be reciprocal. In bringing his remarks to a conclusion, he spoke strongly on the formation of a real labour party, preserving an independent attitude in all political conflicts, and that artisans should record their votes for those candidates who understand, by close acquaintance, the necessities of the wage earners.

Later in the evening Mr. T. B. Davy gave the toast of "The Visitors," and warmly welcomed those who represented the kindred trades, as well as others who had honoured the meeting with their presence. In reply, Mr. J. Read (Typographical Association) dwelt earnestly upon the value of a close federation in the printing trades; and, finally, hoped that not long hence the kindred trades would be able to publish joint lists of "fair offices," instead of, as at present, such being done only by the Typographical Association.

Mr. Pagdin (lithographic printers) briefly thanked the artists for the cordial invitation given to their branch to be represented at that dinner, and earnestly trusted that the acquaintance thus made would be of a lasting character.

Towards the close of the proceedings, the toast of the "Nottingham Branch" was given by Mr. Harrap, who complimented the branch upon their musical and other talent, and upon the advantage they had in the choice of their energetic secretary, Mr. Ludwig.

In response, Mr. Franz Ludwig summarily dealt with the figures arising from their branch register of members. He said that at the second meeting of artists in Nottingham, in 1885, twenty members were enrolled, and of that original number sixteen still remained members of the branch. During the seven years eighty-three members had been registered on the books, whilst there still remained sixty-eight, making it the second branch in the country; and this large membership represented at least ninety-five per cent. of the whole profession in the town. He mentioned that the largest firm in the town had recently made a concession in respect to hours, which, when it became generally known, would undoubtedly result in a similar step being taken by the other employers.

During the evening there were some excellent renderings of songs by Messrs. Schneider, A. J. Hopkins, E. Lee, F. White, T. Langworth, W. J. Stennett, and A. J. Dee. Mr. T. Rausch favoured the meeting with a highly appreciated selection on the violin, whilst Mr. A. H. Allen again performed some really smart acts in legerdemain. Mr. J. T. Farnsworth opened the evening with a good pianoforte selection, and very kindly accompanied the performers of the evening.


MOST of our readers are perhaps aware that Messrs. Furnival & Co. have just been sending out a new catalogue to the printers in the United Kingdom. Possibly there are some whose names may not be on their list of addresses, and who would not, therefore, receive a copy. If so, they request us to say that they will be glad if those who have been omitted will communicate with them, when they will send a copy of the catalogue by return.

THE Diploma of Merit in the Stanley photographic competition is an extremely artistic production, and has been specially designed by a well-known firm of artistic lithographers. We understand a diploma is to be presented with each medal in addition to those which are awarded separately.



## Specimens.

[Will our friends kindly remember to send their specimens either TIGHTLY ROLLED OR FLAT BETWEEN BOARDS; the cost is but a trifle more, and for review they gain in being presented as they come from the machine. If sent unprotected, specimens are usually so crushed and disfigured as to be utterly unfit for criticism or preservation.]

 VERY chaste specimen of lithography is the invitation card produced by Mr. E. Shardlow, St. Martin's, Leicester, of the Leicestershire County Council to the inauguration of the Sloyd Manual Training Classes, at the Medway-street Schools. The invitation is a 4pp. 8vo card, the first page in gold and green on a stone tint, showing a white margin between the tint and the plain gold border; the inner pages contain, on the left-hand side, the invitation proper, the inscription in front of a pointed oval set in a decorated panel, the prevailing colours being chocolate and gold with rubricated initials, with dainty neutral tints admirably harmonised in the background; the third page contains the programme, in a quieter style than the invitation page, worked out in red and chocolate with gold underlining on a light buff tint, the headline in red with white shades on a panel of green tint relieved with gold. Both of these pages are enclosed in Oxford borders of double fine lines in gold with a flat tint between, an azure tint outside of all giving a very neat finish. On the fourth page appears the name of the organising secretary of the Council, showing in white letters in a green tint ground in a gold edge border to match the first page. The design is extremely neat and tasteful, and in general treatment and harmony of colours and tints could scarcely be excelled for chaste yet bright effect, whilst the technical execution is remarkably good—better work could not be desired.

"MADE ENTIRELY IN ENGLAND" is the feature of the new series of children's books with chromo illustrations just commenced by Farquharson, Roberts & Phillips, Limited, of Upper Thames-street, E.C. To say that in get-up, design, and excellence of printing they compare favourably with the foreign importations, is but doing them simple justice. They are imp. 4to in size, with full-page and double-page chromo pictures, and vignettes in the text, which is bold and clear, and in both of the books before us—"The Pied Piper of Hamelin" and "A Seaside Holiday," with brightly coloured designs on the front of cover. The publishers are to be congratulated on the success of their initial efforts.

"TILLOTSONS, BOLTON," have recently inaugurated a lithographic supplement for the convenience of newspaper proprietors in their syndicate who may wish to specially illustrate important events in their districts. For instance, they submit a special litho supplement issued with the *Leigh and Tildesley Journals* of September 16th, to commemorate the opening of the new technical school and public library at Leigh. The design shows a view of the building, portraits of the architects, and the chairman, treasurer, and hon. secs. of the building committee, and the work is both well drawn and well printed.

ON the occasion of the annual excursion of the employés of Messrs. W. & G. Baird, *Evening Telegraph* office, Belfast, a souvenir was presented in the form of a specially designed and illuminated programme, printed on ivory board with gilt rounded edges. On the inside all the work is pictorial and artistic. The background is constituted by bold trellis and lattice work, to which in profusion cling floral creepers and vines. Supported on the trellis diagonally is a miniature copy of the *Evening Telegraph* reduced from a photo. Bursting through the centre of it from behind are seen first the hand and then the head of a grinning newsboy, who says, "Good evening, have you seen the *Telegraph*?" At the upper corner is an excellent likeness of Mr. R. H. Baird, while at the lower opposite corner is a picture of the *Telegraph* buildings. The design is well balanced, exceedingly effective, and excellently lithographed. The design and drawing is the work of one of their own artists. A melancholy circumstance associates itself with the history of this little souvenir. The litho stones were prepared and the design transferred by a gentleman, Mr. Wesley Steele, who will be remembered by all with the profoundest regret. He had hoped to be with his friends at the excursion. He was the overseer of the lithographic department, and had done his part of the task with a loving hand, as the finished work testifies. A few days before, however, in the prime of health and strength, he met his death after a plunge into the sea at Bangor, County Down, a favourite watering place near Belfast. His absence was the only regret, but the programme will be none the less treasured because he assisted in its production.

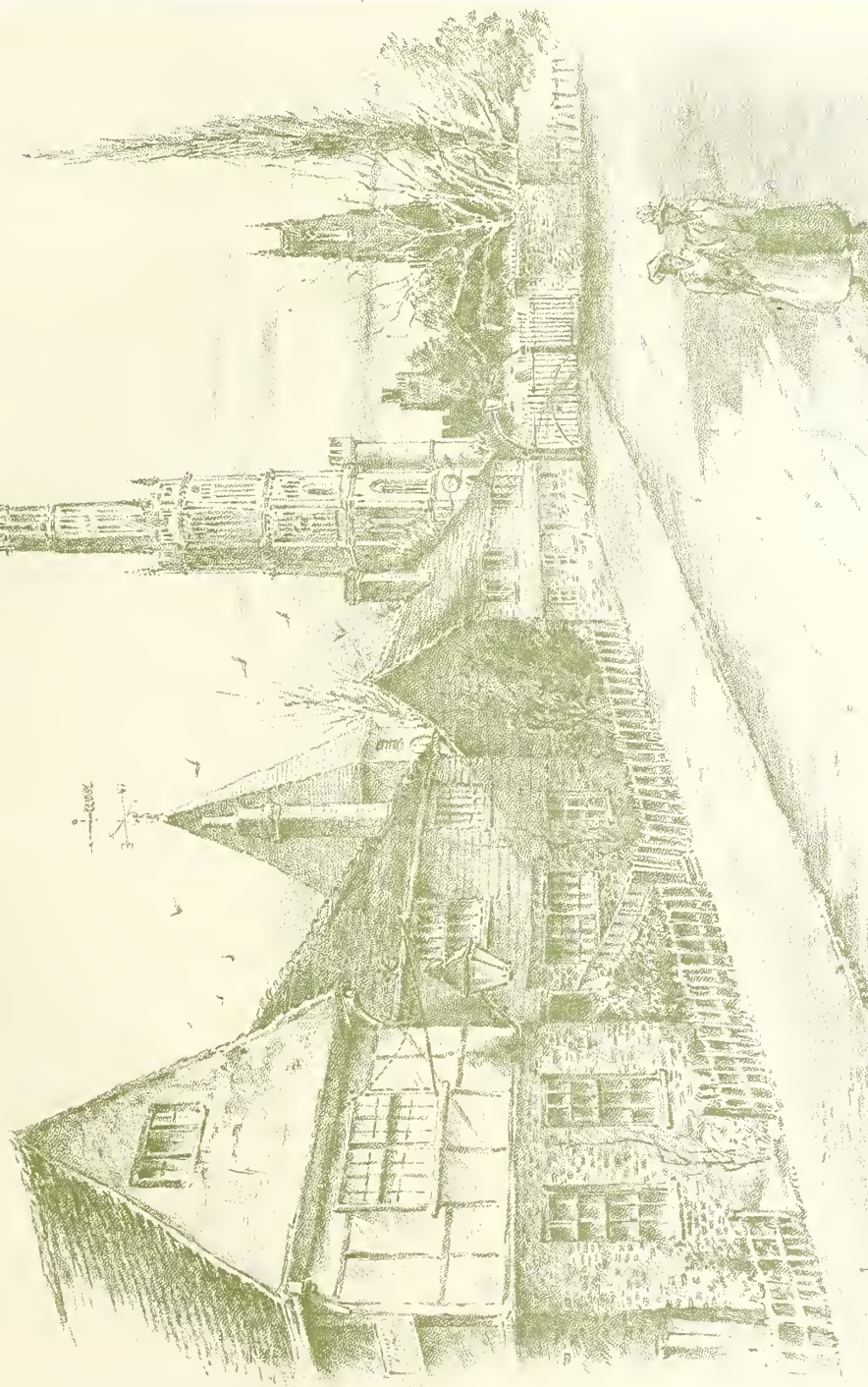
A VERY effective specimen sheet of monochrome litho work is to hand from Messrs. Dibbern & Sperling, Leipzig, consisting of a sheet about double-crown size, the inside showing about fifty views of Continental health resorts, tastefully arranged in panels overlapping each other in various ways; once folded it shows, on the outside, nearly a score more views, similarly arranged; folded again to folio, it shows a page of seaside views, and on the front page the business announcement of the firm is tastefully set out.

MESSRS. BERKS & SON, 12A Watling-street, E.C., who have a card on another page in this issue, send us some excellent specimens of their work in machine-engraving, most of them printed in tints direct from the plates, and showing a variety of tasteful patterns of very fine and well-finished ornament suited for cheques, notes, certificates, &c. Their own business card is a chaste example, both in the variety of tone shewn in the ornament and well-balanced light and shade in the neat and tasteful lettering.

THE hanging card calendars of the "Palatine and United" and "The Manchester" Assurance Companies are excellent specimens of the litho work of Messrs. Palmer & Howe, Manchester. In the first named neutral colours and tints are effectively harmonised on a card of the same tone, and in the second design the effect of black and gold on buff is very good. The workmanship is as excellent as the designs are neat and tasteful.



Supplement to The British Lithographer



Hedley, nee-stone

Chichester

Printed on Grosvenor, Chichester Co's "ACME" Printing Paper



THE new members' certificate for the Kingston Unity of Odd Fellows, just produced in chromo-lithography by the well-known firm of R. Robinson & Co., Newcastle-on-Tyne, is a handsome and attractive example of graphic art. In size it measures  $20 \times 25$  inches, printed on fine white surface card. The design shows the name of the order in a half circle round the group of "Faith" at the top, the sister emblems, "Hope" and "Charity," forming groups below in panels at either side of the certificate, whilst between the groups emblems of the order are tastefully arranged, foliage and flowers filling up the spaces outside of the groups. The design is well proportioned, the groups natural in drawing and treatment, the ornamentation and lettering in excellent keeping throughout, the colouring bright and harmonious, and the printing first-class in every respect. We have seen a few certificates of friendly societies, but scarcely one that is so generally tasteful and artistically effective as this new one of the Kingston Unity.

FROM MR. J. H. ADAM, foreman of the lithographic department of Messrs. Waterston & Sons, Edinburgh, we are in receipt of an unusually attractive showcard, in sixteen printings, for a well-known brand of Scotch whiskey. In size it measures about  $20 \times 28$ -in., the central feature being the name in white letters in a deep blue ground encircled by a chain of daisies, which meet together on either side of a large medallion portrait of the national poet, Burns (an enlarged photo from an engraving after the Naysmith portrait), with clasped bands beneath on a gold ground. Exhibition medals fill the top corners on either side, and below the portrait are verses from "Auld Acquaintance" (the name of the brand), and the distillers' name and address, all on a light grey tint, a very neat border in tints and gold giving a tasteful finish to an artistically designed and skilfully treated specimen of colour work, admirably produced.

FROM those well-known horticultural lithographers, Messrs. Blake & Mackenzie, of Liverpool, Mr. J. Honeyman sends us a couple of handsome chromo calendars for '93, "impressions just as they came off the machine," four on a sheet measuring  $26 \times 34$  inches. The designs in both are rich groups of flowers in solid gold backgrounds, the calendars being let into the gold on small upright panels on the right-hand side of each design. In one design the border is a conventional treatment of ivy leaves, in the other it is in imitation of rich crimson plush. The flowers are magnificent specimens effectively grouped, the colouring brilliant yet soft and delicate, and the technical execution in the best and most finished style.

THE new business card of Mr. W. Sarvent, Broad-arrow-court, E.C., is an effective piece of design and engraving, showing well-balanced light and shade. The monogram on shield, through which the initial "P" is interlaced, is capitably done, and the printing (direct from plate), in black on azure-tinted card, is excellent.

A COLLECTION of chromo labels and general commercial lithography from Mr. Odo Midwood, Manchester, shows neat and tasteful designs and lettering, bright colouring, and excellent printing.

THREE handsome examples of emblematic society certificates have been received from the well-known firm of Messrs. Blades, East & Blades, Abchurch-lane and Finsbury, E.C., who make a speciality of the production of this class of work and illustrated banners for benefit and trade societies. The emblems before us are:—The Amalgamated Society of Lithographic Printers, with which, no doubt, most of our readers are already familiar. It is  $26 \times 19$  inches in size, and handsome both in design and finish. The various panels arranged around the certificate illustrate the progress of the craft from the old hand-press days to the latest and most improved steam engine, a laurel-wreathed head of Senefelder being introduced at the top, the craft emblem—in a border of flags and roses—forming an appropriate centrepiece. Equally attractive is the certificate of the Associated Shipwrights' Society. A series of views include pictures of many kinds of vessels, ranging from the traditional Noah's ark, Norman galleys, old wooden line-of-battle ships, modern sailing and steam craft, and armour plated men-of-war, pictorially illustrate the march of progress in this essentially British industry. A floral headpiece contains the title in a neat scroll design, and a central oval, flanked by figures representing Britannia and Neptune, shews a modern shipyard and docks—a veritable hive of industry. Side vignettes, more especially those bordering the certificate at the foot, well illustrate the "benefits" side of the Society. Lastly comes the craft emblem of the Amalgamated Society of House Decorators and Painters. Somewhat conventional in style, the tastefully arranged borders, beautifully coloured and designed, and the effective arrangement of centre panel, headpiece, and official certificate well demonstrate the work of this useful craft. A broad centrepiece shows a decorated wall surface with a central bay including a finely-treated coat-of-arms, and an illustration shewing the work of the sick branch of the Society. On either side is a decorator at work. This broad central band is crowned by an allegorical female figure and appropriate emblems and tools are inserted here and there with tasteful effect. The technical execution of all three emblems leaves no room for criticism. Messrs. Blades, East & Blades' own circular, designed in imitation of a silk banner, shews equally tasteful and well-finished work on a smaller scale.

MESSRS. W. R. ROYLE & SON, 96 Newgate-street, E.C., seem to have an unlimited flow of ideas for effective design in commercial engraving. About a score of new business cards and invoice and memo. headings, recently executed by them for trade customers, show remarkable freshness and originality in design, with a variety of neat and taking styles of lettering that are positively refreshing as against the monotonous plain writing and black-letter texts so generally seen in this class of work. In Messrs. Royle & Son's specimens there is not one ordinary looking specimen, and the general treatment of light and shade and finish of details is equal in every way to the evident care and thought bestowed on the designs themselves, which being, in the examples before us, all printed direct from plate, show up in their pristine beauty of "first impressions."



MESSRS. BLADES, EAST & BLADES seem to be always on hand when printing for the Lord Mayor is about. Their latest is the invitation card for the banquet at the Guildhall, on November 9th, for the inauguration of the Rt. Hon. Stuart Knill. The design (allegorical and heraldic) is from the wall painting on the west side of the lobby of the Guildhall, representing the unconquered, and therefore virgin, city of London, peacefully seated within her protecting gates in a bower of English roses, and guarded by her two dragons, the supporters of her arms. She is murally crowned, robed in her livery, holding in her hands her ancient charter. In front flows a conventional river, spanned by Old London Bridge, terminating with Bridge Gate (the Lord Mayor's ward), while beyond are the masts of shipping in the port. On a scroll is the text—"Except the Lord keep the city the watchman waketh but in vain." In the base are the arms of the Lord Mayor and sheriffs, with the official insignia of the mayoralty and the sword-bearer's cap of maintenance. Above them have been introduced representations of the progress of civilisation, and of the foundation of our great Indian Empire—viz., the General Post Office and the Old East India House. In the border, in the upper part of the design, are the arms of the guilds of which the Lord Mayor and sheriffs are liverymen. In the centre, crowning all, is the crest of the city. Ten stones have been used in the printing, and the work has been done in the finished and artistic style characteristic of the firm. Messrs. Blades, East & Blades have, we learn, also secured (in competition) the order for the fifty-guinea framed testimonial to be presented to the late Lord Mayor by the corporation of London.

MESSRS. HUGHES & HOLGATE, Bank-chambers, Hargreaves-street, Burnley, submit some very tasteful specimens of their work as lithographic artists, shewing portraiture, decorative ornament, fancy initials, and plain and fancy lettering, all excellently done and harmonious in colour and general treatment. Their own business circular, designed in the style of an illuminated address, is not only artistic in design, but shews more than the usual freedom and freshness in treatment, urban scenery, portraiture, groups of birds and animals, flowers and foliage, monogram and ribbon work being all skilfully and harmoniously combined, the printing being also of equal merit.

THE artistic calendar inserted in this issue as a specimen of the work of Mr. G. L. Henderson, speaks for itself as the production of a designer and engraver whose reputation for the finest work is well known to the trade. In printing the entire edition direct from plate—an expensive proceeding—he has shown that considerations of cost do not deter him from doing his very best in demonstrating his ability as an artistic craftsman. We hope to show more of Mr. Henderson's work soon.

SEVERAL very effectively designed and excellently printed business and other cards are to hand from Herr Ferdinand Schlotke, of Hamburg. The lettering, especially of the missal initials, is noticeably good, and in no instance is gold used; the effect is bright and pleasing.

## Notes and Queries.

*[Through this channel anyone submitting a question upon printing or allied processes can receive an answer, either from our staff of practical technical writers secured for this Journal, or from some reader who may be better qualified to answer "special" questions.]*

**I**N reply to Mr. Grantham, of Leeds, he may feel assured that we shall do our best to touch upon every point which he has raised. Such notes, however, are very useful to guide us as to what particular points are of a more engrossing nature than others. To mix any ink, the best course is to commence by grinding it from the tin into a small quantity of stiff varnish. Time and labour spent in this way are amply repaid, for as soon as the ink is well worked into the stiff varnish the necessary quantity of medium or thin varnish can be worked into it in a very short time, and will give a good reliable printing ink. It is quite true that machine ink is generally thinner than press ink, from the fact that the machine runs more quickly, and thin ink is thus rendered less liable to thicken the work than it would be in the press with slower rolling. Black printing ink alone would be only a medium drier, but the blue added should assist it materially. Black inks generally have sufficient blue in to make them good driers, and if that is not the case then the remedy is to add driers. There is really no rule by which it can be said that "black should be mixed stiff and coloured ink thin." All colours should be first worked into a small quantity of stiff varnish and subsequently reduced according to whether required for a body colour or tint. The method of mixing a small quantity of the recently invented "pomade" to body colours, which have been ground into stiff varnish only, is a great improvement.

The brightness and dullness of coloured inks depends upon:—(1) The amount of varnish used to prepare them as inks; (2) the hard or soft nature of the pigment itself; (3) the number of colours which lie under it, or over it, in a chromo print.

Scarcely any coloured ink need look bright if the amount of varnish used be small, and the remainder of the reducing agent be an oil or a soft prepared pomade. The spottiness of inks results from much the same cause. Such pigments are rapid driers, and in printing even will separate out into a mottled surface. This can be prevented by using a soft pomade in making the ink ready for the machine. Such agent prevents the rapid drying, and assists in keeping the particles equally distributed. The difficulty with a vermilion is its weight, and to mix it properly it must be far more thoroughly mixed in stiff varnish than any other pigment. To prepare it for the machine the use of thinner varnishes must be very sparing. The soft pomade referred to is prepared by Messrs. Mander Bros., of Wolverhampton.

In answer to Mr. F. Laycock (Prestwich), the best publication we know upon half-tone photo-zinc etching is by Carl Schraubstadter, jun., and published by him at St. Louis, U.S.A. It is thoroughly modern, and combines simplicity in manipulation with its elaborate description of every item.

In reply to W.J.G., Birmingham, we draw attention to the reply to Mr. Grantham. The cause of the mottled appearance arises undoubtedly from:— (1) Using too much varnish in all the pigments; (2) in not using a softening oil in the more rapid drying colours; (3) in using dryers instead of a soft pomade in the later printings.

The first printings, containing too much varnish, have dried on the paper, have given it a gloss, and have produced a hardened surface. Each printing has increased these faults and latterly you were quite unable to get the ink and varnish to reach the paper through the hard layer of varnish on the surface. Naturally the later colours would not dry, and the addition of driers would simply cause the colour to dry out in a mottled manner. We refer you also to the reply to Mr. Quinn, of Belfast, in No. 7 of this journal, and impress upon you the necessity of keeping pigments soft. Why some sheets have printed properly and others not so is very difficult to understand. It may be that some sheets were more absorbent than others, or had better opportunities of drying between the printings.

MR. COOK, of Mansfield, enquires as to the relative differences between a hand and steam press. In reply, the main difference is continuity of work. The labour of the handpress soon tells a tale upon the pressman, who, with an assistant, cannot be expected to work at the same speed as a steam press. A steam press may be calculated to give one impression per minute if not large. Larger stones require a lot of rolling up and setting, and cannot be expected to give so many impressions. In every way the steam press is an advantage, but cannot be compared with a machine.

A SUBSCRIBER at Hull wishes to know if printed work can be varnished only where the matter is printed, by printing a varnish in the machine. Such a practice has frequently been invoked, and with first-class results. An off-set from the key is put on the stone and filled in solid. After it has been rolled up and washed out, the stone can be put into the machine and any tint of varnish can be printed on the sheets. Any ordinary thin or tinting varnish can be used. This method should be adopted for all small catalogue and bookwork.

HERBERT G. WILLIAMS writes: Would you kindly advise me, through "Notes and Queries," whose photographic apparatus would be most suitable for photo-lithography? Also the cost of same, as I intend practising in conjunction with lithography. ANSWER: We have found the outfits supplied by Messrs. Ross and Co., 112 New Bond-street, London, W., in every way satisfactory. They give special attention to lithographers' requirements. Write them for price lists.

In reply to Mr. Hilyer, of Cheltenham, we should advise you to read over the article on "Facts about the Hull Zinc Plates," in No. 7 of this journal, and study it alongside the book of directions for use of the plates issued by the Hull Company. We are pleased to hear that our last answer to your query proved equal to your best expectations.

In reply to T.K. (Sheffield), it may be stated that the printing upon tin plates is not at all generally well known yet, and information on the matter leaks out very slowly. In No. 6 of this journal, on page 24, was published an extract upon "Metallachromy," in which the process by M. Jozs was described. Such process is in use in some degree in the large tin printing works of this country, and in some instances the tin is printed direct, as on card, by etching the stone into high relief. In some cases the flat gold backgrounds are lacquered on first, and the printing done on the top of it. Much depends upon the excellent varnishing at the finish to get the brilliancy of the flat and other colours.

MESSRS. CUNNINGHAM & LAWRENCE, 25 College-hill, E.C., write: In reference to the paragraph on the last page of No. 6, we suggest that a much surer and simpler method for reversing a negative is to strip the film from the glass, and either reverse it on the glass or harden it to preserve it from damage. This is done by first soaking the negative for several hours in a solution of chrome alum to harden the film; then wash well and soak in a strong solution of hydrochloric acid and water; after a few minutes the film will come away freely, when it should be carefully transferred first to clean water to wash out the acid, and then into a bath of alcohol.

In reply to Mr. W. Adamson, we can state that grained zinc plates are not sold by any dealer. Polished plates of superior quality can be obtained from Messrs. B. Winstone & Son, 100 Shoe-lane, London, E.C.; and the Hull Patent Zincplate Co. supply grained zinc plates all ready for use in lithography.

LITHO STONES IN NEW ZEALAND.—A discovery of interest to printers, and which may yet prove to be of importance, has been made by Mr. A. M'Kay, Government geologist, at Fairburn, Mangonui county, north of Auckland. He was shown some specimens of darkish grey stone which was being quarried for road metal, and found it to be true lithographic stone, of great purity. At the last meeting of the Philosophical Society Mr. M'Kay exhibited a small sample of the stone, properly dressed and drawn upon, and a print from the same, executed at the Government Survey Office, in no way inferior to work from the best Solenhofen stone. Experiments on a larger scale are to be made, and are awaited with interest. There is an abundant supply—"thirty miles of it," Mr. M'Kay says—but it would be too much to expect that it will all prove of equally fine quality.—*Typo.*

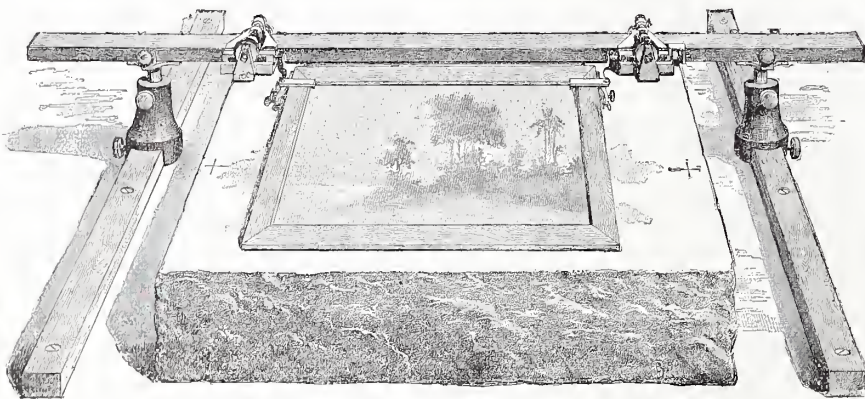
ART is no light matter for those who would really master it. Its science is as needful as its poetry, for its works may be ideally conceived; but they need to be produced as things of reality to bring them within the reach of comprehension.—G. PARRY.

It is with considerable regret that we learn of the death of Mr. George Sheffield, the brilliant black and white artist, a member of the Manchester Academy of Art.



## Trade Notes.

**I**N pen language, "They come as a boon and as a blessing," and the advantages of Day's Shading and Printing Mediums can scarcely be over-estimated. Any contrivance which materially shortens merely mechanical labour, and allows of the worker using his abilities to the production of effects requiring higher skill and knowledge, is worthy of the best consideration of intelligent workers, and he is woefully short-sighted who nowadays distrusts inventions for the saving of labour. This applies to a very large extent to the use of these mediums, and to the facilities they offer the artist for easy and rapid work. The process consists in the use of transparent mediums consisting of thin films of gelatine, smooth on one side, and with the lines, dots, etc., in relief on the other. These are applicable to all classes of work, and capable of practical and highly artistic results. The work etches and transfers well on either stone or zinc, and being



simple, rapid, and generally adaptable, requires no departure from the usual methods. The process may be used in connection with either crayon or pen, and with work on grained stone or grained zinc. The transparency is a valuable feature, allowing outlines and offsets of drawings to be in constant view through the film. The gelatine films are stretched on frames with removable hinges adapted to any size of frame, so adjusted as to enable the operator to place it just where required. The same mechanism allows for shifting the film and increasing the tones in the same stipple or tint, and facilities are provided for combinations producing a large variety of texture. The use of the films supplied produces over one hundred tints in line, stipple, grain, and other textures, representing an extensive saving upon the old outlay for copper and steel tint plates. From the remarks of those using the mediums, and more especially from personal observation—having introduced them into the De Montfort Press litho works—we know that their use produces a saving of time and labour which is simply astonishing, and gratifying both to artist and employer. All artists' ateliers should be provided with a set. Particulars and prices may be obtained from Mr. W. O. Felt's business announcement elsewhere.

## "Silver Point."

**I**N a prefatory note to the catalogue of his silver-point drawings, "few but fit," on view at the gallery in Old Bond-street, Mr. Charles Sainton explains for the benefit of the uninitiated that "Silver point is simply a drawing made upon paper with a wash of opaque-white with a pencil or stylus fixed in a wooden holder." That from instruments and materials so simple as these results so elegant as the present works should have been obtained is a fact which adds to the interest of the exhibition a pleasant element of surprise. To Mr. Sainton belongs the credit of having revived an art which, though practised with success by many of the old masters, had fallen in modern times into undeserved oblivion. The charm of colour is, of course, absent, nor is any great depth or brilliancy of tone attainable by means of this particular process; but the subtle treatment of such lights and shadows as may be procured, the daintiness of touch everywhere discernible, the equal freedom and accuracy of the drawing, the spirited grace that "lives along the line," all give to these little studies an undeniable charm.—*Morning Post*.

CHEAP WORK, cheap help, cheap materials and cheap advertising never yet led to permanent success. The printers who do the best work, pay the highest wages and use the best materials are the only men who are making a fortune and a reputation which are worth having. These are the men whom the younger members of the fraternity should imitate.

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EACH ADDITIONAL LINE, 6d. EXTRA.

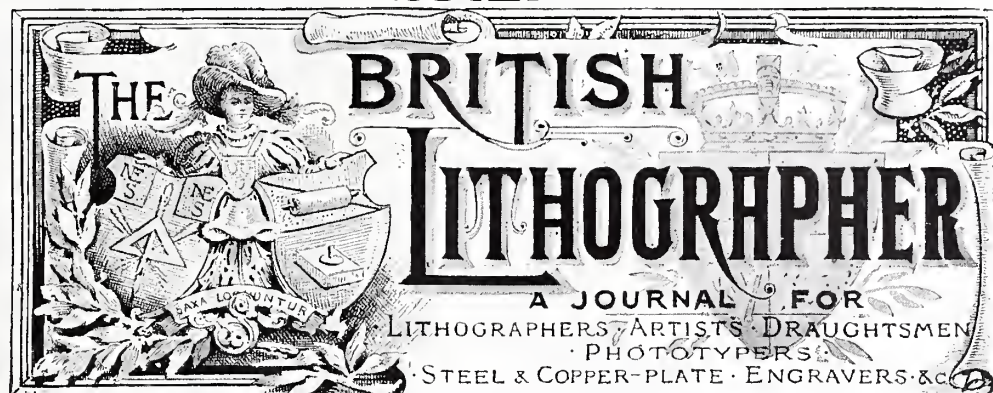
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VOL. II.—No. 9.

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WE are pleased with the generally hearty reception accorded to our last issue, especially to the chromo supplements. We find, however, a strong divergence of opinion as to the "Plant Form" supplements. When we inserted slightly shaded outlines, many artists wrote that they wanted "something more elaborate"; we gave them in the last two issues "something more elaborate," but they don't appear to be any more satisfied than previously. As our own artists appear unable to satisfy them in this respect, we propose to solicit from artists at large drawings suitable for the purpose. From those sent in, one or two will be selected for insertion in each number, and we will pay for them at the rate of half a guinea each. By this means we hope to elicit from artists themselves designs that will please and be of use to their brethren at large. All designs must be in black on white cardboard, and, to prevent damage through the post, be sent in between brown boards, with the name and address of sender on the back of the drawing, and marked "Plant Form Competition" on the outside, and addressed to *The Editor of THE BRITISH LITHOGRAPHER*, De Montfort Press, Queen-street, Leicester, on or before March 1.

READERS may sometimes wonder why we introduce a large amount of information respecting Photography. The fact seems scarcely to require explanation, for we are sure that most lithographers—artists and printers—have seen how closely photography is allied to lithography. It is this close relation which compels us to place before our readers every available item which bears in the least upon lithography, so that the principles may be thoroughly understood by all lithographers, and place them in a better position to cope with the ever-increasing adaptability of photography to the printing arts.

## B.L. Examination Papers, No. 6.



THE response to the last set of Examination Questions was by no means satisfactory, only two papers being sent, and we had decided to discontinue them. Recent representations from former competitors and from some of the class teachers have, however, shewn us that the interest in these question papers is reviving, and so we have decided to try another series. Appended are the rules and the questions for the Sixth Competition, taking up the number from where we left off last year.

### RULES.

1. Answers must be received on or before February 21st, 1893. Any received later will be disqualified.
2. The Elementary Questions are intended for apprentices and young journeymen; the Advanced Questions for those of riper experience.
3. Competitors must be subscribers to the B.L.
4. Papers for competition must be headed with competitor's *nom de plume*, and accompanied by separate slip containing full name and address. Envelopes must be directed to *The Editor, THE BRITISH LITHOGRAPHER*, De Montfort Press, Leicester, and marked "B.L. Competition" in top left-hand corner.
5. The Editor reserves to himself the right to publish any answer or set of answers sent in. The result of the Competition, with the prize papers in each set, will probably be printed in the succeeding issue of the B.L., with competitor's name attached.
6. No responsibility can be accepted for the return of MS., though whenever stamps are sent for that purpose every endeavour will be made to do so.

We offer a prize of Ten Shillings for the best set of answers in each of the two grades, as appended:—

### ELEMENTARY QUESTIONS.

1. What is the object of the cams in the hand lithographic press? Give sketches. (20 marks)
2. What is the meaning of a hard ink and a soft ink? Is there any general rule to decide whether it is a bad or good drying pigment by its appearance in the solid form or in the can? (25 marks)
3. Describe, in detail, the structure and mode of making a hand-press roller. (15 marks)
4. Which kind of tympan do you prefer? Describe the effects of all the different materials used as tympan. Can you work without a framed and hinged tympan, if so, how? (20 marks)
5. What is the meaning of a lithographic "doctor"? Give a good recipe. Do you know of any specially prepared substitute for the old-fashioned "doctors"? (20 marks)

### ADVANCED QUESTIONS.

1. From which surface, zinc or stone, can old lithographic drawings or transfers be more readily and permanently erased? Are there any means of washing out the work from zinc or stone, after which it will not appear? In either case, give experimental proofs of your statements. ["Washing out" does not mean "etching out."] (35 marks)

2. What are the requirements of a good bronzing machine? Describe any machine which you may know meets these requirements. (30 marks)

3. Discuss closely the various materials used for blanketings on machine cylinders, and give your reasons for preferring any particular one. (20 marks)

4. State clearly your opinion as to the bearings, oscillations, and adjustment of the scraper box in a lithographic hand-press; and state if you think it could be improved. (35 marks)

5. What is the nature of a finished plain printing paper, which has been loaded and sized? Are there any chemicals in it which can act injuriously upon ink? (30 marks)

## Colour Photographs of the Spectrum upon Albumen and Bichromated Gelatine.

It is known that a dried layer of albumen, or of bichromated gelatine, is modified by light; the organic matter becomes less hygroscopic. Most of the photo-mechanical printing processes employed in industry are founded on this action of light. A film of albumen (or of gelatine) bichromated, extended over and dried upon glass, is exposed in the camera in contact with a mirror of mercury. It is enough then to put it in water to cause the colours to appear; this washing in pure water in removing the bichromate, fixes the proof at the same time that it develops the same. The image disappears upon drying the plate, to reappear each time that it is wetted afresh. The colours are very brilliant; they can be seen at all incidences—that is to say, outside the incidence of regular reflection. On viewing the plate by transmitted light, the complementary colours to those seen by reflection are clearly visible. Bichromated gelatine behaves in the same way, save that the colours appear in their place, not when the plate is fully wetted, but when it is rendered slightly humid by breathing on the surface.

The theory of the experiment is easy to state. As in the case of sensitive films containing a salt of silver, the mercury mirror gives rise during the exposure to a series of maxima and minima of interference. The maxima alone impress the film, which consequently takes a lamellar structure, and divides itself into couches alternately expansible and non-expansible by water. Thus when the plate is dry no image is seen, but whenever the water is applied it is imbibed by the non-impressed parts of the film; the index of refraction consequently varies periodically in the thickness of the film, also the power of reflection, and the coloured image becomes visible. When albumen is employed it is necessary to give a coating of this liquid to glass, to dry it, and in addition to coagulate it with bichloride of mercury before plunging it in the bichromate of potash. Without this precaution the non-impressed albumen will dissolve during the washing in pure water. The bichloride of mercury can be applied either before or after the plate has received the luminous impression.—G. LIPPMAN, in *Photography*.



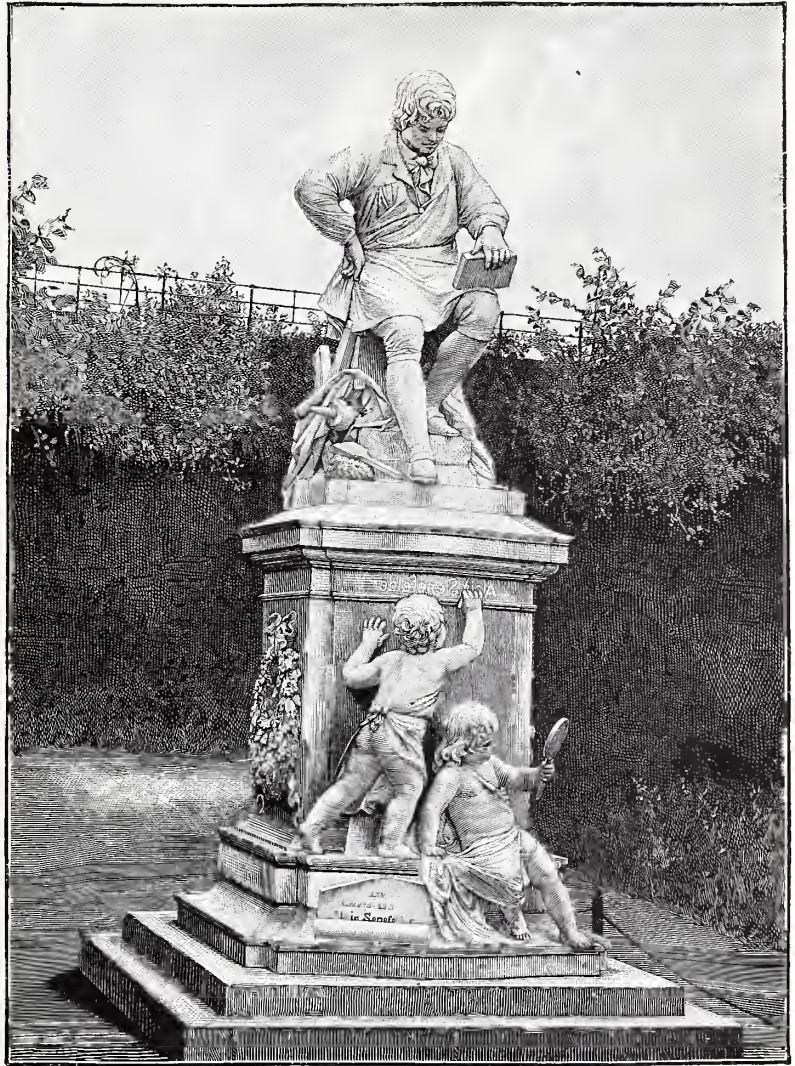
## Orthochromatic Photography.

A SUGGESTION has been recently brought to our notice, says *Optician*, which, although it does not necessarily follow is a strictly novel one,

may be worthy of some consideration by our readers. This is that the colour screens used in photographing oil paintings, and in other similiar applications of orthochromatic photography, would be needless if the artificial light used were strongly tinged with yellow or with red. In working with sunlight, common plates are, of course, more nearly orthochromatic as the sun sinks towards the horizon, and as, therefore, the light proceeding from the sun becomes yellower and redder. But for copying pictures, artificial light is generally used in preference to a beam of sunlight, and, therefore, besides all the colour screens, refractors, etc., that have been used for decompounding the image, and that are equally applicable to the illuminant itself, we have additional facilities in the various chemical means by which the colour of flames may be regulated. The production of pure, and at the same time intense, spectral light of very limited range, is of importance if only for the sake of its application in photo-colourimetry. These matters furnish an ample field for experiments of an interesting character.

**SNOWFLAKES.**—The extreme beauty of snowflakes when they are examined with a magnifying lens is well known. In every textbook of physics one may see drawings of those pretty six-cornered stars spreading their fine feathery branches. But even the best drawings give no idea of the real beauty of the snowflakes when they are examined under a still higher magnifying power. A Russian photographer has now found the means of photographing those images received through the

microscope, and thus fix them so that every one may admire them at his leisure. A thick woollen cloth was spread to receive the snowflakes, then they were rapidly examined, and the prettiest of them were chosen and placed on fine silk muslin under the microscope. A



NEW STATUE OF SENEFELDER AT BERLIN.

[RECENTLY a new monument erected to Senefelder, the inventor of lithography, was inaugurated in Berlin. The monument is a great artistic success, and represents Senefelder in a sitting posture, holding a lithographic stone in one hand and a pencil in the other. We are indebted for the accompanying illustration of the statue to the courtesy of Herr Julius Maser, of Leipzig.]

strong electric lamp being used to throw light upon them, their magnified images could be photographed and the most beautiful symmetrical figures made in the finest imaginable lines, like most perfect artistic engravings, were received in this way.—*Ex.*



## Chromo Calendars.

MESSRS. TAYLOR BROTHERS, LEEDS.

**A**DVANCE proofs of their 1894 chromo calendars shew that the progress we have always had to chronicle in Messrs. Taylor Brothers' productions has been amply sustained. The specimens received well repay individual examination.

Proceeding in order of size, the first, 14 × 20-in., favourably impresses one at the outset: a child subject treated in the best style. The title is "Family Cares," and it depicts a winsome little lassie standing near a tree, trying, with small success, to hold three large dolls in two small arms; the half-perplexed and half-appealing expression on the sweet face is very taking. In the next larger size, 23 × 18-in., the first is a summer scene, in which a perspiring swain has just reached the riverside, in time to see his desired lady companion rowed off by a rival. His evident discomfiture is very comic as the lady's *au revoir* forcibly indicates the undoubted fact that in this case only "Two's Company." The picture is capably drawn, the surrounding view being very attractive. One phase of the fascinating tennis game is well represented by a young couple at afternoon tea. The figures of the lady at the table and the handsome young fellow leaning against a tree are splendidly treated, the subject is well portrayed, and we are assured on the authority of the title that the "tiff" in progress is only a "Passing Cloud." A home-like children's picture, "The Evening Prayer," depicts two children engaged in their evening devotion at the bedside. A wintry scene represents two "Limbs of the Law" endeavouring to obtain entrance into a house, one plying the knocker, the other peeping through the keyhole. A capital figure subject of a charming young lady with a favoured tabbie nestling on her shoulder makes a dainty picture. The handsome face looking down on the pussy vies with that favoured animal in deserving the title of "You Beauty." A tasteful border in blue and gold is well in harmony with the subject. A typical hunting scene illustrates a lady-rider on a magnificent mount "Giving the Lead" to the field. Perhaps the daintiest subject among the collection is the charming figure of a young beauty simply and tastefully "Dressed for the Party." The pale pink tint of the dress, the gauzy wrap, and the whole tone of the picture are most attractive. "Samuel in the Temple" is an oriental subject, showing the awakened child half rising from his couch near an open casement, through which is caught a glimpse of the deep blue of an Eastern sky at night, the clear moonlight shining brightly on the white dome and towers beyond. A lighted lamp casts a side light on the child with capital effect, and the scene is treated so well that it tells the whole story of the call and the surroundings.

Among the third size, 20 × 28-in., are some splendid figure examples. "Miss Lazybones"—a young girl in easy chair by an open window, in an attitude of utter idleness—hat, flowers, and books either on the

floor, or gradually nearing that convenient receptacle, is faithfully drawn. A gold and ruby border materially assists the effect of the deep colouring.

An artist at work at the foot of some wide stone stairs in a narrow picturesque street—colours, box, brushes, bag, and artists' paraphernalia strewn about, is making a sketch of a portion of his surroundings, reminding one of a corner of steep Clovelly, and is evidently impressed with the value of a buxom damsel filling her water jug, as "An Unexpected Model." The picture is capably treated and will be most acceptable. "Alnwick Castle," a fine landscape with tree-fringed stream in the foreground, crossed by a romantic old bridge, with the stately castle in the background, is a beautiful reproduction, sure to be valued as a pleasing picture. The last in the series, a Scotch home scene, shews a returned one-armed veteran recounting the stirring story of "How I Won the Victoria Cross." Standing in the centre of a homely cottage interior, and with the inmates around in rapt attention, he is evidently living the story over again. At the top of the picture are the royal standards and arms, and appropriate scenes representing incidents in the war. As a piece of good colouring, bright and realistic, the picture is almost perfection. All the calendars contain neatly printed dates at the foot, and are excellently finished, with appropriate borders in colours and gold.

Good taste in drawing and colouring is shewn throughout, and the splendid work of the artist is seconded by the no less studious attention of the printer. Messrs. Taylor Brothers possess a highly-trained staff, and are to be complimented on the successful results of their endeavours to provide the best work and satisfy the exacting demands of widespread customers.

SHADING INKS.—Chrome yellow or rose lake used sparingly will often be found to be of service in deepening the shade of delicate tints, when the change desired is very slight. Blue, yellow or rose lake will afford best results when strong, bright inks are to be deepened in shade, but great care should be exercised by those unaccustomed to this work, as these darker colours will frequently have a much greater effect than is anticipated. Add the dark colour a very little at a time, and watch the result. Never make the mistake of attempting to darken coloured inks with black, as by its use the brightness and delicacy of any transparent coloured ink is destroyed.—*Artist Printer.*



MARTIN BILLING, SON & CO.

THE admirable collotype supplement given with this number, showing some of the new chromo-calendar designs for '94, issued by Martin Billing, Son & Co., speaks highly for the excellent character of the work they are producing in their collotype department, which is now becoming an important branch of their business. Any of our friends requiring collotype pictures for magazine or book illustrations should "make a note of it."



CHROMO ALMANACS.

SPECIMENS OF MARTIN BILLING, SON, & CO.'S DESIGNS.  
REPRODUCED BY THEIR COLLOTYPE PROCESS.







BY CHARLES HARRAP.

## CHAPTER V.

### LITHOGRAPHIC WRITING INKS

[continued].

#### LEMERCIER'S AND OTHER FRENCH INKS.

**A**T the conclusion of the recipes given in chapter IV., the last mentioned is one prepared by Lemer cier, and as it is considered by the French as an excellent one, it is advisable to note its mode of preparation.

The wax and tallow are placed in a copper pan and mixed whilst melting with an iron spoon. The pan should be large enough to hold three times the quantity of the whole recipe. The two ingredients having melted, the soap—not previously dried—is added little by little, each addition having become incorporated before a second is made. The soap, wax, and tallow thus melted and mixed, it only remains to add the gum-lac, in minute pinches until it is all worked well into the molten mass. The ink now presents a liquid form, with heavy white vapour or fumes rising from its surface, and causing it to thicken. The pan is now removed from the stove, and the fumes are set on fire. The burning is not continued long. If the recipe consists of about 30 grammes (463 grains) the burning may continue for two minutes. Then extinguish the flames, and allow the mixture to stand for a minute or two before adding the black. The black has to be previously made into a smooth paste with a little turpentine. This black paste is well stirred into the above mixture, and the whole is replaced on the stove to be boiled for another quarter of an hour. The ink is then poured out upon a soaped surface—preferably well-sized paper—and allowed to cool; after which it is again well melted, to refine it, instead of grinding it. Experience will prove how long this operation should be continued before it is poured into moulds or into a frame placed on a stone, all of which must be well soaped to prevent adhesion. If put into the frame on a stone, before it is quite cool it should be cut into pieces, and allowed to dry and cool.

If this is the recipe followed by Lemer cier in the preparation of the lithographic writing ink so well known in the trade, then the fact of its ingredients and manufacture being known will account for its behaviour and will prescribe its treatment. This brand of ink is somewhat soft; it is particularly black and readily mixed with water. It is not the ink which can be used for exceedingly fine work, since its greasy character is not as highly sensitive as is required for very bare line work, and the amount of black in it is antagonistic to fine work. It is not the ink which is used for repairing work on stone, at the press, or machine, for it is not strong enough. But although it is not sufficiently reliable for the above purposes, yet for stippling it is the one thing needful. In this class of work it flows readily from the pen, and makes a good black dot, so that the stippler can absolutely see the effect of his work as it grows under his hand, in a firm black ink, having an evenness of tone all over quite different to the effect produced by the more greasy yet lighter coloured ink known as "Vanheimbeck's." Again, wherever Lemer cier's ink is used due notice must be taken of the large proportion of soap in it. This soap must be got rid of before proving can be gone on with, and to effect this, all well stippled stones in which it has been used, and show a good body on the surface, must be first etched, however weak the etching may be. Subsequently, this etching process will be more closely dealt with, and at present it is sufficient to say that the etching should consist of gum and a small addition of nitric acid, which is brushed over the work and allowed to dry on it before the work is washed out and rolled up. The details of the manufacture show that the remarks made in the last chapter, with reference to burning the ink after the lac is added, are actually correct for the present day, and represent the French method of preparation.

#### RECIPES OF OTHER FRENCH AND CONTINENTAL INKS.

The following recipes are given as simple repetitions of information already published in a French encyclopædia, and as such it is not intended to discuss them in anything but a general way. The first recipes are given by Mons. A. M. Villon, and are as follows:—

	I.	II.	III.	IV.
Tallow soap .. .. .	93	..	..	4
Wild beeswax .. .. .	125	..	..	..
Mutton tallow .. .. .	62	10	..	..
Light gum-lac .. .. .	93	..	..	..
Lampblack .. .. .	30	3	6	2
White wax .. .. .	..	10	..	8
Gum-lac .. .. .	..	10	75	..
Mottled or Castile soap .. .. .	..	10	..	..
Very hard tallow soap .. .. .	..	..	15	..
Button mastic .. .. .	..	..	15	2
Powdered soda .. .. .	..	..	15	..
Tallow .. .. .	..	..	..	2
Venice turpentine .. .. .	..	..	..	1

Of these recipes No. III. is the most like the common one popular in England, and closely resembling the fifth of Senefelder's recipes given in the last chapter.

The second recipe from the encyclopædia is that of M. Knecht, the pupil of Senefelder:—

Yellow wax .. .. .	8 parts.
Tallow .. .. .	6 ..
Gum-lac .. .. .	10 ..
Button mastic .. .. .	2 ..
White soap .. .. .	8 ..
Venice turpentine .. .. .	1 ..
Olive oil .. .. .	1 ..
Lampblack .. .. .	2 ..

From the extreme simplicity of some inks it seems difficult to understand why so many ingredients are introduced.

The next, however, is of a more simple form, and is the recipe of M. Desmadryl:—

Wild beeswax .. .. .	10 parts.
Button mastic .. .. .	2½ ..
Gum-lac .. .. .	7 ..
White soap .. .. .	5½ ..
Black .. .. .	2¼ ..

But the absence of a greasy material, such as tallow, must give this ink a very brittle character.

Following this, again, is another of simple form, compounded by MM. Chevalier and Langlumé, which bears a striking likeness to the common English form already alluded to:—

Soap .. .. .	4 parts.
Mutton tallow .. .. .	4 ..
Wax .. .. .	4 ..
Gum-lac .. .. .	3 ..
Lampblack .. .. .	q.s.

The amount of lampblack varying according to circumstances, as already explained in chapter IV.

The next formula published is:—

Yellow wax .. .. .	10 parts.
Tallow .. .. .	4 ..
Gum-lac .. .. .	12 ..
Button mastic .. .. .	1 ..
White soap .. .. .	4 ..
Turpentine .. .. .	1 ..
Linsed oil .. .. .	1 ..
Lampblack .. .. .	12 ..

The final recipe is, according to M. Villon's opinion, the best of all. Its mode of preparation is in every way similar to that already described for Lemercier's ink, and its ingredients are:—

Yellow wax .. .. .	15 parts.
Tallow .. .. .	10 ..
White soap .. .. .	30 ..
Vaseline .. .. .	5 ..
Gum-lac .. .. .	20 ..
Mastic .. .. .	7 ..
Linsed oil boiled, with Prussian blue ..	3 ..
Lampblack .. .. .	10 ..

If M. Villon's opinion is correct, then the prevailing English idea of simplicity of composition is wrong. It is certainly true that in England the majority of draughtsmen use the inks made on the Continent, and can only judge their working capacity by usage, not knowing their composition. It has already been shewn that Lemercier's ink is simply the four ingredients—tallow, wax, soap, and lac. But what Vanheimbeck's consists of is not generally known. If it should partake of the nature of the recipe just given, or of M. Knecht's formula, then complexity rather than simplicity is actually required to produce an ink of first-rate working powers.

The above formulæ are all compounded in the same general way as already described for Lemercier's ink.

[To be continued.]

BLUE TRANSPARENCIES.—A French photographic artist, Rossel, has discovered a simple means of producing blue transparencies of great beauty. He exposes commercial cyanotype paper beneath a negative until the image is intensely visible. Then it is thoroughly washed and placed for a quarter of an hour in a ten per cent. solution of bichromate of potash. After the print has again been well washed it is allowed to dry, and then rendered transparent by placing it on a warm glass and treating it carefully with paraffine. The print is now framed between two glass plates. The cyanotype paper employed in this case, giving white lines on a blue ground, is very easily prepared—that is, plain photograph paper is placed in a solution of 25 grammes ammonio-citrate of iron and 25 grammes of potassium ferri-cyanide in 150 c.c. of water, and then dried in the dark.

INTERESTING DISCOVERY IN PHOTOGRAPHY.—Experiments in photography, made by the Duc de Morny in his amateur studio at Levallois-Perret, have led to a useful discovery. He has been able to photographically impress paper of any size or thickness. By this means, a likeness can be fixed like a monogram on note-paper and on railway or other tickets. Eighty different *silhouettes* can be taken in a minute, and at small cost. The Duc de Morny has communicated his discovery to the Minister of War, who intends to utilise it in the "books" carried by soldiers, and in which their descriptions, records of service, and so on are inscribed. The Russian Grand Dukes now in Paris have also decided to adopt the invention in the army of the Czar, and have asked the inventor to send one of his "collaborators" to St. Petersburg.

PRINTING ON SILK AND OTHER FABRICS.—*Apropos* of M. Villain's recently published method of photo-dyeing, Mons. A. D. Lavroff writes to the *Paris Photographe*, detailing his method of printing on silk, cotton, &c. He prepares the following mixture:—

Tartaric acid .. .. .	1 gramme.
Common sugar .. .. .	10 grammes.
Boiling water .. .. .	100 c.c.

This is boiled for a minute, and 5 grammes of borax added, the mixture left for six hours, the clear liquid decanted, 4 grammes of common salt added, and the solution filtered. The fabric is coated with the solution, and when dry is sensitised, dried, printed, toned, &c., as usual.

PHOTO-ZINCOGRAPHY.—For transferring photo-litho copies of zinc plates Herr Albert gives, in the *Photographic Times*, the following method:—The copy, printed, developed with fatty ink, and dried as usual, is then dusted in with a finely pulverised mixture of ten parts of asphaltum and one part of pure beeswax, and all superfluous asphaltum removed by means of a fine camel's-hair brush and a tuft of cotton, and slightly heated over an alcohol lamp to melt the asphaltum together with the fatty ink. It is then passed through the saturated alum bath to keep it uniformly moist, laid between moistened blotting paper, and finally transferred upon a zinc plate.

# What is Colour?

## CHAPTER VI.

### • • PRACTICAL COLOURING. • •



BY gradual steps through the previous chapters, the subject of colour has descended to a commonplace reality, from its elevated standpoint of theory and practical demonstrations with light as colour filtered through transparent media, each exerting its own special force in breaking up light and colour into simple forms.

Already it has been stated what these simple forms are, and in concluding the last chapter it was agreed that notwithstanding how far we believe in the theory of the PRIMARY COLOURS being red, green, and violet, yet for practical purposes it must be considered that red, yellow, and blue are the PRIMARY PIGMENTS. And further, that whilst any conceivable colour can be compounded from the primary coloured lights of the spectrum, with the addition of pure white light, yet with pigments this is impossible. For, given the three primary pigments, with the addition of green and white pigments, it would be soon demonstrated that the multitude of colour shades now in existence could not be produced from five such simple pigments.

The compilation of a most exhaustive colour scheme some time ago by Mr. C. H. Wilkinson, including at least six thousand different shades, goes far to prove the fallacy of the last remark. But his pigments were red, yellow, blue, white, and black; and in his preparations, which were printed by a Manchester firm, every colour produced is so numbered as to shew exactly what weight of each pigment is used to produce the shade. Still the characters of many shades remain, which have not been imitated by these combinations.

The coloured pigments that are manufactured from so many sources have their own characteristics, which can only be imitated by using the same character of materials. A colorist is fully aware of the almost insuperable difficulties he would encounter in trying to prepare a number of different greens from a standard yellow and standard blue. It might be done by the additional use of the other pigments—red, white, and black. But the purposes of the colourist are not served in this roundabout way, because, by a careful selection of some twenty to thirty pigments, colours can be compounded in a few moments by the use of one, two, or three of them, without using either white or black—a very important omission. •

Colourists of the advancing school are becoming more and more alive to the use of a large rather than a small number of pigments, and printing ink manufacturers are rapidly following the same inclination. In this train of thought probably the colour printer is the least advanced, because he has not had the opportunities of technical education in the past which the colourist has had, nor has he devoted much of his spare time to the study of this most important branch

of lithography. This want of advancement characterised all colourists alike some years ago, when Mr. Field, in his exhaustive work upon colour, made the following comments:—

“New colours, it is true, have to be learnt, for each pigment has its own peculiar habitudes, chemical, physical, artistic; but if they be good and durable, no amount of time and study upon them is thrown away. To think less of the quality of one's materials than of the effects which can be produced with them is a mistaken policy; and to be content with that quality when better can be had, shews no love of art, but rather indolence and apathy.

“Perhaps one reason why freshly introduced colours have not as fair a chance as they are entitled to, is due to the fashion which prevails of exclaiming against the fugacity of modern colours. If their detractors would confine themselves to certain colours, there could be no denial; but to assert, as is often done, that the cause of modern pictures not standing is owing to modern pigments generally is unjust. It is not the materials which should be blamed, but those who use them. The fact is, that the artist's knowledge has not increased in proportion to the greater variety of colours at his command. In the early periods of art, when the palette was chiefly confined to native pigments, the painter could not go very far wrong. Nowadays but too many, wanting the skill of the old masters, seek to make amends for it by brilliancy of colouring with imperfect knowledge of their materials; the result is obvious. The palette, we admit, wants weeding, not only of bad new colours, but of the bad old ones. This, however, must be the work of time, and depends not upon the colourman—for where there is a demand there will be a supply—but upon the artists themselves. To this end increased acquaintance with the properties of pigments is required, whereby they may be able to choose the best from the fugitive. . . . We have heard it remarked that there are too many colours already; to which we reply, there are not too many good colours, and scarcely can be. The more crowded the palette is with reliable pigments, the more likely are the worthless ones to be pushed from their places. In our opinion there is ample room for fresh colours, provided they are durable; and we have as little sympathy with the stereotyped cry of there being too many, as with the fashionable unbelief in modern pigments. Certainly the artist who seeks for permanence amongst the whites, reds, or blues, will not be troubled with a superfluity. Certainly, too, colours are as good as ever they were, and better—better made, better ground, better prepared for use. But fast and fugitive pigments are more numerous, and for that reason need more careful selection.”

To the thinking mind, these remarks are bristling with truisms which the colourist of to-day cannot shut his eyes to. The indolence and apathy of employers and employees alike in getting the best pigments, and in studying their use, are doing more than we can imagine to drive away from this country the bulk of the best colour work. The leading firms, of course, are excepted; but we are fully aware of firms who drop into this indolent state, and whose business last



year and this (1891-92) was decreased by thousands of pounds because the advertisers had come to the conclusion that firms in this country could not print the quality of colour which was required. And whilst Mr. Field must be forgiven for some of his remarks, which are apparently trade advertisements, yet he is not far wrong in his estimate of colourists and pigments. Men need to be more independent and more persevering. Employers should, if they wish to keep the business of this country together, travel with competent men, and pick up information with which to enrich their craft. Employers we know, as a rule, consider they have a right to do as they please. But the great French economist, who died only a few years ago, laid it down as a law of economy that employers should use a considerable portion of the wealth produced by their employées in obtaining the most advanced information possible, to improve not only the craft, but those employed in it. Such a proposition also cuts in the direction of the employé, whose duty it is to study, as far as lies in his power, and the scope for such study is so wide that men have no excuse for not taking the opportunities—the nature and manufacture of all colour pigments, the schemes of colouring, and such other particulars as shall bring him more nearly on a level with the Continental producer, who has an instinct for the mixing, blending, and using of colour, such as it is not the lot of the Britisher to possess, except by sheer study.

In the extract from Mr. Field's work, there was, in our opinion, one of the most direful mistakes. He writes:—"The palette, we admit, wants weeding; not only of bad new colours, but of bad old ones. This, however, must be the work of time, and depends not upon the colourman—for where there is a demand, there will be a supply—but upon the artists themselves." Such remarks convey a want of honesty on the part of makers, and produce the very feeling of distrust in modern pigments which the writer is rating down so strongly. Not only is there a need of better acquaintance with colours and colour stuffs by the artist and printer, but first of all the colour maker must be the fountain-head for all knowledge on this matter, and in honesty to his customers only put upon the market such inks as shall be permanently reliable. If this is not done, the ink maker will be greatly to blame for business leaving the country, and he will have only himself to blame for his own loss of business. That worn-out nostrum of "demand and supply" does not hold water. We all know things for which there is a strong demand; but the supply of them would ruin the people. So let it be with all manufactures; if there is not a healthy demand, an honest demand, or a demand of a permanent character, manufacturers should not stoop and bemean themselves by thrusting upon the market articles of a lowering and valueless nature.

[To be continued.]

A COLOUR CHART will accompany the next chapter of "What is Colour?"

AN exhaustive notice of Mr. J. W. Harland's new book on "The Printing Arts" has had to be left over till next issue, on account of pressure of other matter.

NIEPCE, NOT DAGUERRE.—A proposal to erect a new monument to Daguerre in his native village of Brie-sur-Marne has moved M. Leon Vidal, the editor of *Le Moniteur*, to remark that, but for Niepce, there would have been no Daguerre—photographically speaking, of course. Niepce was really the inventor of photography. Daguerre contributed his brick to the edifice, nodoubt; but it is often forgotten that, without Niepce, photography would not have been known, and that in that case Daguerre would not have been the inventor of the Daguerreotype. Niepce was the real father of photography. It is an error to suppose also that Daguerre discovered the development of the latent image, inasmuch as a latent image existed in the bitumen process, being developed by dissolution of the unaltered bitumen. Development of the image on silvered copper was a different species of reaction, upon which modern negative processes are based; and without attempting to minimise the importance of this discovery of Daguerre, M. Vidal concludes by pointing out that he followed Niepce. M. Vidal does service in the cause of historical truth by once more insisting on the relative positions occupied by these two men in the field of photographic discovery.

LITHOGRAPHIC STONE DEPOSITS IN THE OURAL MOUNTAINS.—The *Journal de St. Pétersbourg* states that to the number of mineral riches of the Oural not yet worked are to be added important quarries of lithographic stone, situated in the district of Krasnooufmsk, province of Perm. These deposits have been known for fifteen years, and the lithographic stone which they yield has been recognised as excellent, but until recently nobody has ventured to work the quarries in question. Last winter the quarrying of the lithographic stone was commenced, and according to the *Novoe Vremya* it will be sold in dépôts established in St. Petersburg for the purpose.

It is stated that Dr. Meyer, of Berlin, has discovered a process by means of which aluminium can be produced at *two pence per pound*. In 1828 the price was £1,000 per pound. The price to-day is 4s. per pound. Here we have vast possibilities opened to us. There is said to be ten times more aluminium in the world than there is of iron, lead, copper, zinc, nickel, gold, and silver combined. It is stronger than iron, and more malleable than copper, as hard as silver and one-fourth the weight, as white as polished steel, and is unaffected by the atmosphere. This discovery should do much to facilitate the making of aluminium faced plates as a substitute for stone, as described in No. 6 of this journal.

"WE are in receipt of Vol. I. of THE BRITISH LITHOGRAPHER, and to say that it is a beautiful product of the lithographic and printing arts is but to hint at its merits. Outside of its beauty, it is extremely valuable from a technical standpoint, containing papers discussing the condition and progress of the art and all the news regarding improved methods and new wrinkles. It has reached first place with a single bound, and is regarded as an authority among the trade in America as well as in England."—*Geyer's Stationer*.

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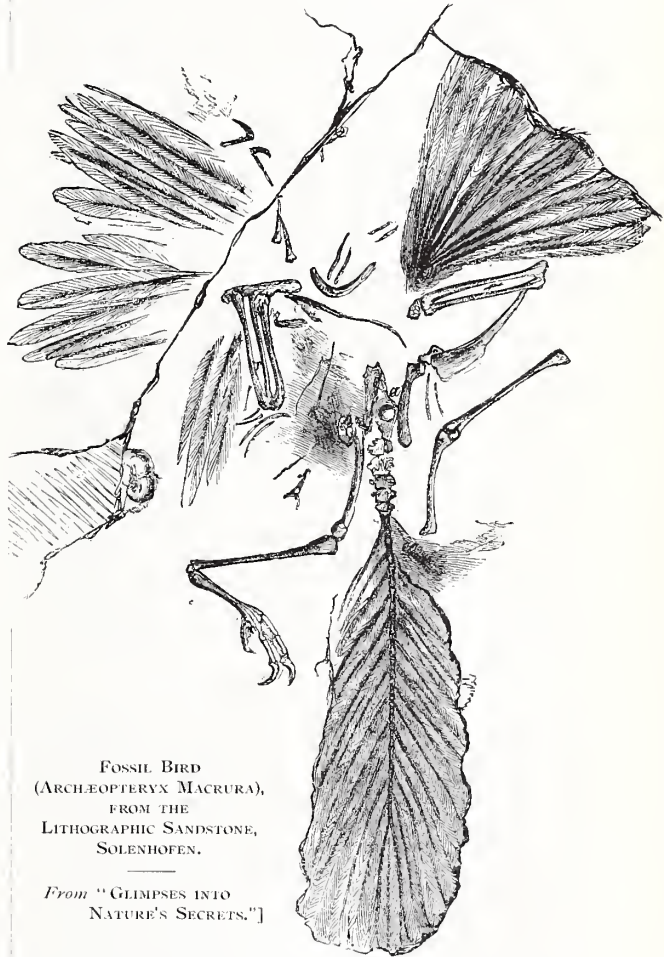


## Book Notes.

"PHOTO-MECHANICAL PROCESSES," by W. T. Wilkinson (Hampton, Judd & Co., 13 Cursitor-street, E.C., demy 8vo., cloth, 3/6) is a new work on the same lines as the author's previous technical productions, and serves as the latest practical guide to photo-zincography, photo-lithography, and collotype. A business-like introduction tersely opens the way for the discussion of the subjects in detail, and the comparisons drawn and differences noted in the processes greatly assist the work of the student. In five distinct parts, the various processes of working are separately described, and a careful examination shews the book, as a manual on photo-mechanical processes, to be complete and up to date. In Part I. is a detailed description of the negative for photo-zincography in line and half-tone, and photo-lithography in line, with a careful explanation of the various steps in the utilisation of the negative and its preparation. Part II. gives a full account of the manipulations necessary in the actual practice of photo-zincography in line, the apparatus used in printing, the transferring, and a most useful enumeration of the apparatus required for line etching. Part III. explains the methods of obtaining the screen, hints on the best processes for grained negatives, and a valuable chapter on printing on zinc in half-tone. Part IV. is devoted to the subject of photo-lithography in line, with special reference to the various methods of obtaining transfers, and leading up to the process of obtaining photo-litho prints in half-tone from collographic plates. The fifth and last section forms a complete guide to practical work in collotype, including a consideration of the negative, the apparatus required for its development and the preparation of the plate, and a discussion of the methods of printing on press and machine. Throughout, the work teems with hints and explanations on the higher developments of printing. The practical nature of the work, and the evident thorough insight into the processes and the full practice of the work, as evinced by the writer, make his books of the greatest value to students, and this latest may be heartily recommended to the careful attention of all printers.

"AMIDST NATURE'S REALMS," by E. A. Martin (Raithby, Lawrence & Co., Ltd.; crown 8vo, bevelled boards, illuminated side, cloth, 2/6), appeals directly to the widespread class of lovers of natural history. Close students and casual observers of the various phases of nature, alike deplore that they are unable to thoroughly study some special branch or learn more of other interesting features, and this book is intended to meet such a want. In the two divisions of the book, "Life in the Living Present," and "Annals of a Far-away Past," a large amount of highly interesting information is incorporated, the whole work being written by one who is evidently thoroughly in sympathy with his subject. The utmost care has been exerted to make the book a credit to the printers and publishers. Paper, typography, illustrations, printing, and binding are all of the best, resulting in an unusually attractive example of good book-making.

"GLIMPSES INTO NATURE'S SECRETS," by E. A. Martin (Raithby, Lawrence & Co., Ltd.), is a companion volume, in price, style, and size, to "Amidst Nature's Realms." It is just the book for the observant tourist to carry in his pocket on his rambles. "By Shore and Shallow" treats of the interesting objects cast upon or inhabiting the coasts, and which most of us have at one time or other desired to know something about. "Rock-Written Stories" is a chatty geological description, calculated to impart much useful information. Illustrations and diagrams well assist the author's descriptions, making the work a thoroughly acceptable one to readers. The get-up and finish of the book are of the most satisfactory nature.



FOSSIL BIRD  
(*ARCHEOPTERYX MACRURA*),  
FROM THE  
LITHOGRAPHIC SANDSTONE,  
SOLEHNHOFEN.

From "GLIMPSES INTO  
NATURE'S SECRETS."

"OUR COUNTRY'S BIRDS, AND HOW TO KNOW THEM," by W. J. Gordon (Day & Son, 21a Berners-street, W.; 6/-) forms a welcome companion volume to that useful book "Our Country's Flowers," by the same author and publishers. The obvious difficulty of making a list of the "British" birds is avoided by adopting the whole authorised list, and aiming at identifying rather than classifying. The utmost assistance

is afforded to the reader and enquirer by carefully arranged chapters, and splendidly drawn and coloured plates and diagrams. The first chapter contains the names, both popular and technical, which are used throughout; the second, a list of the common and rare local names, with references to numbers under which the birds are described; other chapters contain a systematic list, and examples for identification; worked-out dimensions of birds are provided so as to assist in the identification by measurement, concluding with a useful tabular arrangement for the identification of eggs. Thirty-two full-page admirably chromolithographed coloured plates amply illustrate the subjects, and form a notable feature of the book. Carefully written and arranged so as to offer the utmost facility for the research of the reader, the book is almost a necessity to an ornithologist, and certainly should be in the hands of all who like to know something about the feathered inhabitants of our isles.

*The Practical Photographer*, published by Messrs. Percy Lund & Co., London and Bradford, is a capable exponent of practical photography, the Christmas double number to hand being replete with varied and useful information on matters photographic, both in practical work and as regards the interests of the members of the widespread brotherhood. The number just issued completes the third volume, and is specially attractive as containing picture supplements of a pleasing character, full-page half-tone blocks illustrating varied aspects of scenery, and giving a bright tone to the number. The journal is evidently popular both with subscribers and advertisers. The accompanying "Christmas Annual" of *The Practical Photographer* is a nicely got-up portfolio, 10 x 8-in., containing eight full-page studies, printed on antique paper, and intended for portfolios and wall decoration. They have been issued in response to a demand for good impressions of the supplements which have appeared from time to time in the journal itself. The subjects have been prepared by well-known photographers, and the collection forms a decidedly attractive series.

#### CHEMICAL METHOD OF ENGRAVING ON WOOD.—

M. Delaurier, in the course of his business, employed wooden agitators to dissolve the bichromate of potash or other salts, which he put into a mixture of sulphuric acid and water. These agitators gradually dissolved, without being carbonised, as would be the case with sulphuric acid alone, especially if at all concentrated; and without softening, either, as with nitric acid. M. Delaurier has not endeavoured to ascertain why this should be so, although he has no doubt but what the investigation would be of scientific importance and of interest to trade; but he suggests that his observation be utilised for a method of engraving on wood, the block being coated with a resist varnish, the design being drawn in with a point as when engraving on metal, then to etch away the wood by immersion in the following mixture:—

Sulphuric acid .. .. .	4 parts.
Soda bichromate .. .. .	1 "
Water .. .. .	6 "

M. Delaurier made the experiment with perfect success.

## An Important Invention.



WE are in receipt of special information regarding a most important invention, which at present touches only letterpress machines, but is intended for application to lithographic machines also. The invention is due to one of the managers of the firm of Messrs. Blades, East & Blades, of London, and is the outcome of years of experience. It touches upon a very vital portion of the printing machine, viz., the inking rollers. Inequality of rolling is not by any means a novelty, and printers are only too familiar with its effects. Endeavours have been made to overcome this fault, but hitherto not quite successfully. Rollers have been weighted, over-ridden, etc., and have been set in loose forks, in order that evenness of rolling may be obtained, but so long as the traverse of the machine does not allow of a full supply of ink being left upon the inking rollers, it is necessary to resort to double rolling. This is not economical, and the contrivance invented by Mr. J. Andrew is calculated to entirely overcome the difficulty. The nature of the invention is summed up as follows:—

"Instead of securing the inking roller forks stationary to the side frames of the machine as heretofore practised, we adapt them to slide parallel to one another in suitable guide ways secured to the said side frames or otherwise.

"These forks, with the inking rollers placed in them in the usual way, are moved to and fro in such a manner that as the inking table approaches the cylinder of the machine, the said forks and inking rollers are moved in the opposite direction to such an extent that all the inking rollers, including the one nearest the cylinder, are caused to make a complete revolution at least in contact with the inking table, so as to take a full supply of ink over their entire circumferences.

"When the forks and rollers have reached the end of their movement away from the cylinder (and the full extent of the inking table is traversed), they are moved back again towards the cylinder in readiness for the next outward journey of the form or slone.

"The above-described movements may be effected by a cam on one of the rotating shafts of the machine operating a rocking-shaft by means of a sliding-rod or otherwise; arms on the said rocking-shaft act upon levers turning on fulcra at the side of the machine and acting upon the sliding-forks. The movement towards the cylinder may be effected by the cam, or, if preferred, by a spring or weight."

Enquiries, until further notice, to be addressed to Mr. J. Andrew, c/o Messrs. Blades, East & Blades, Leonard-street, Finsbury, E.C., where the movement may be seen in action.

THE well-known lithographic art publishing firm of Hildesheimer & Faulkner has been dissolved by mutual consent. Mr. Hildesheimer will carry on business in future at 4 New Zealand-avenue, and Mr. Faulkner at 41 Jewin-street, under the style of C. W. Faulkner & Co.



## Difficulties in the Collotype Process.

**I**F an opinion can be formed from the amount of correspondence we have received during the last few months, says the editor of the *British Journal of Photography*, the collotype process—or, as it is termed on the Continent, lichtdruck, and here passes under various pseudonyms—is receiving far more attention than hitherto. As in every process, so in this, those who take it up for the first time soon find that some little difficulties have to be encountered; and also that, when textbooks have to be solely relied upon, they are not so very easily surmounted. Hence, no doubt, the number of letters continually coming to hand recounting failures and asking their cause. From the meagre details usually furnished the questions are, in most instances, impossible to answer with any degree of certainty. To do that properly, not only should we require to know all the precise conditions under which the plates were prepared, but those also under which they were treated before printing in the press; in fact, to see all the operations performed. Usually, novices in any process are prone to attribute their failures to the formula by which they have worked, while the actual cause of trouble is rather in the conditions existing at the time. Notably is this the case with the process now under consideration, for its successful working really depends more upon conditions than upon mere formula.

In the abstract collotype is one of the simplest of processes. A ground-glass plate is prepared with a substratum, which acts as a bond between the glass and the printing film. This consists of bichromated gelatine, to which other substances are sometimes added. The plate is then exposed under a reversed—as regards left and right—negative, then washed and dried. It is then moistened again when it is ready for printing from, in the same manner as a lithographic stone is treated. All this appears simple enough; but there is no disguising the fact that to work the collotype process successfully, under the continually varying conditions of temperature and humidity of the atmosphere of this country, requires a certain amount of judgment, which can only be acquired by practice. Therefore, beginners should not be discouraged by a few failures at first, as they are only what might be expected. With a view to the assistance of those experimenting with collotype, we will refer to a few of the more important points in connection with the process.

One thing of great importance is the gelatine itself. One of its properties must be hardness, to withstand wear in the printing; while, at the same time, it must be freely absorbent of moisture. Generally, this characteristic is obtained by a mixture of two kinds—one hard and of an insoluble nature, and the other of a soft and absorbent character. The blending of two or more kinds in the right proportions to secure the end desired requires some little judgment. The proportions, however, that would be best in the winter would not be suitable in the summer, as the film would

then be too soft, while what is necessary in summer would be too hard and non-absorbent in winter. However, a few experiments made from time to time with different samples of gelatine will determine the most suitable proportions of each quality to employ. As different batches of gelatine, even from the same manufacturers, are more or less variable, it is customary with those who work on a commercial scale to purchase a large quantity of the most suitable kinds at a time, and thus avoid unnecessary experimenting. The thickness of the printing film is of importance, as it affects the grain. But the experimentalist will soon be able to determine that most suitable for the work in hand.

A very important factor in the preparation of collotype plates is the temperature at which the printing film is dried, and this must be regulated according to the result desired—whether a coarse or a fine grain. The slower the plate is dried, and the lower the temperature at the time, the finer will be the grain, while, on the other hand, quick drying at a high temperature—within certain limits—is conducive to a coarse grain. If, however, the temperature is carried too high, and the drying effected too quickly, there may be an absence of grain altogether. The fineness, or otherwise, of the grain is also influenced, as we have just said, by the thickness of the film, as well as by the character of the gelatine of which it is composed. Hence it will be seen that no definite temperature for drying can be given, though it is sometimes done in textbooks, as it is influenced by other conditions. It need not be explained to our readers that the granularity of a collotype plate is a reticulation of the film, similar to that which gave so much trouble in carbon printing many years ago, when the pictures were first developed on glass.

Next to the preparation of the plate itself, the most important point for consideration is the amount of moisture in the film at the time of printing. If too much is present the ink will be rejected where it ought to take, and if too little then it will adhere where it ought to be rejected. The proper hygroscopic condition of the film often proves a stumbling block to beginners; in fact, really good printing plates are often condemned, though they have no other fault than being too moist, or, the contrary not damp enough.

Some workers moisten the film with water alone, but the more general practice is, nowadays, to treat it with a mixture of glycerine and water, with the addition of a hygroscopic salt, such as the chloride of sodium or of calcium, etching the plate as it is generally termed. When the atmosphere is very dry, more of the salt must be employed; but when it is very damp, it often has to be omitted altogether; indeed, with glycerine and water alone, in very damp weather, it is frequently found necessary to stop the printing, remove the plate from the press, and partially dry it by heat, owing to an excess of moisture being absorbed from the air while printing.

With beginners it not infrequently happens that a difficulty is experienced in getting the film sufficiently moist to reject the ink where it is not required. This may be due to the use of too hard and non-absorbent a gelatine at the onset, or to the plate being kept for




too long a time before exposure, so that the film has become insoluble or non-absorbent; or possibly it may have been over-exposed. An under-exposed collotype film will take moisture readily; a rightly timed one less so; and an over-exposed one only with difficulty, if at all. In the first case, trouble is met with in getting the ink to take on the film. In the last, it takes more or less uniformly all over the surface.


In the foregoing we have pointed out the principal difficulties, and their causes, that beginners are likely to meet with in essaying this most valuable process. The causes being known, the difficulties may then be more easily be overcome, or often avoided altogether.

### American Copyright.

THE FIRST DECREE UNDER THE ACT.

HE first decrees entered under the new Copyright Act by which English publishers are enabled to obtain copyrights in the United States, have just been entered in the United States Circuit Court for the district of New Jersey. The suits in which these decrees were made were instituted by Messrs. Eyre and Spottiswoode, Her Majesty's printers, against the *New York Recorder* Company, and the American Lithographic Company, and had relation to a copyright in an engraving entitled "Little Lord Fauntleroy." Messrs. Eyre & Spottiswoode, who, as proprietors of the Woodbury Company, publish engravings and works of art of all descriptions, employed Mr. Charles J. Tompkins, an English engraver, to reproduce in pure mezzotint the painting by James Sant, R.A., entitled "Little Lord Fauntleroy." This engraving was duly copyrighted in the United States. Shortly after the first artist's proof appeared in the American market the engraving was copied by the defendants, whereupon the plaintiffs immediately instructed their representatives, Messrs. E. & J. B. Young & Co., of Cooper Union, N.Y., to institute suits. Mr. Rowland Cox, a member of the legal profession in New York, was retained to conduct the case, and Mr. W. Hugh Spottiswoode went over to represent the firm of Eyre & Spottiswoode. The statement of complainant was based upon the allegation that the engraving had been used in the manufacture of the chromolithograph made and sold by the defendants, which fact was supported by numerous coincidences which were pointed out. A preliminary injunction was granted by his honour Judge Lacombe, based upon an inspection of the engraving and the chromos, and expert testimony. The final decrees now entered recognise the rights of the complainants and provide for perpetual injunctions restraining the sale of the chromolithographs. The painting after which this engraving was made was in the Royal Academy Exhibition of 1891. The infringement complained of consisted of a lithographic reproduction issued as an "art supplement" to the *New York Record* of February 28th, 1892, under the title of "A Noble Friend." The result of this litigation will be satisfactory to all who are interested in British art.—*B. & C. Printer & Stationer.*

### Important Invention in Cheque Printing,

ITHERTO cheque printing has been confined to lithography, and as a necessity of the process, the ink used has always been of a greasy nature. Ink of such a kind can be far more easily tampered with than a less permanent dye. In saying less permanent, we mean less tenacious rather than fugitive. A fugitive pigment would be entirely out of place, whilst one having a deep stain but readily open to smearing is a condition of things in demand. The Government of this country has expended a vast amount of skill in perfecting first the printing of Bank of England notes, and lastly the printing of the postage stamps upon such paper and with such inks as to defy alteration and fraud. Such, however, has not been the case with cheques, and they continue to be printed on paper and with such ink as assist rather than deter manipulation by any one desirous of committing fraud.

At last a step has been made in the right direction, and the discovery of this important invention has been made in the firm of Messrs. Blades, East & Blades, London. In the first place, they have applied the printing of cheques to the letterpress machines, the whole of the cheque, lettering and tint—if any—being produced at one time, direct from electrotypes. Samples of their work prove that the fineness and clearness of the engraving do not suffer from this mode of printing as compared with lithography, whilst the speed of production is accelerated.

But the invention does not stop at that point; its most important feature is the ink with which they print. Their inks are all made by themselves; they guarantee them not to be fugitive; and lastly, they are water-colours. The importance of this last feature cannot be over-rated. It will be readily seen that if anyone should make an attempt to alter a cheque, they are at once baffled. The method of dissolving out the writing ink by a bleaching agent cannot be attempted, for immediately the liquid is applied, the printing ink is dissolved and commences to run and smear the whole surface.

Nothing could be a greater boon to the commercial world, nor even to those who would be inclined to act fraudulently. We remember reading the reminiscences of a successful thief, and one of his most pungent remarks was that he would never have become a thief had it not been for an accident which threw the temptation in his way. Once he had seen the ease of such acts, he was incited to further similar ones. So it is with cheques. If a man finds a way of fraud to be easy, he will pursue it; but place an insurmountable difficulty in his way, and he will give it up or seek some other means. There is much to be thankful for in this invention from Messrs. Blades, East & Blades, as it removes from the world a great source of crime—temptation.

In our next issue we shall probably have something to say (with illustrations) about an important invention for seasoning paper for chromo-litho work.

We undertake Artistic Chromo &

"De Montfort Press,"  
The De Montfort Press,  
KING STREET, LEICESTER,  
AND, QUEEN STREET,

Raithby. Lawrence & Co. makers.

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100

# Commercial Lithography for the TRADE





## An American School of Lithography.



WE rejoice with American lithographers on the success they have achieved in their agitation for the establishment of a school of lithography. Should the idea be carried out as it promises, lithographers "across the pond" will in all probability possess the most perfect school of lithography ever planned, and when firmly established, we shall look for developments which will place the United States alongside European countries as regards technical achievements in lithography, and remove the stigma often cast at the States of sacrificing knowledge to dollars, and the future workman to the present desire for personal enrichment. So far as can be definitely stated at present, the special department will be established at the Drexel Institute, and this choice is a wise step in the proceedings, being probably the best technological school in the United States, both as regards its situation and practical equipment.

Beyond this, the supervision of a trained educator, who is thoroughly conversant with the study and actual practice of the art in all its details, is another advantage which will be derived from the location of the department at the Drexel Institute. There is no doubt but that Dr. MacAlister is amply qualified for the work before him, if the instruction is given over to his care. Since the proposal of the movement he has taken the liveliest interest in the matter, and has throughout encouraged the National Association to take active steps to forward the scheme. He is specially qualified by his ability as an organiser of long experience, and as one who is fully *au fait* with the artistic requirements of the true lithographer.

Through its Philadelphia committee, the National Association of Lithographers has offered a programme for the working of the school, which we reproduce, and, as will be seen, it is comprehensive and thorough, with the exception, perhaps, that the latest applications of allied processes with the art might profitably be added to the syllabus.

### PLAN AND SCOPE OF THE SCHOOL FOR LITHOGRAPHY, AS RECOMMENDED BY THE NATIONAL LITHOGRAPHERS' ASSOCIATION.

To insure a practical, thorough training in the art of lithographing through the medium of a school, in which not only fundamental theories shall be taught, but in which theoretical knowledge shall be supplemented by practical demonstration and experiment, it is deemed best to reduce the course of training to its simplest form.

In other words, to confine the scope of teaching to the elementary principles of lithography, and to regard the various processes and forms of the art only in the light of a separate and supplementary training thereto.

This course of training will not only ensure the successful pursuit by practical education of the student, but will confine the art to its legitimate domain. It

will allow the quarters set aside for this purpose to be used by a greater number of students, rather than to an extensive installation of a plant and its attendant cost.

With the expressed idea in view, the course of training shall consist of three departments, comprehending the whole field of practical lithography, as follows:—

- (1) *The Engraving Department.*
  - (a) Lettering and ornamental.
  - (b) Vignette and decorative.
- (2) *The Crayon Department.*
  - (c) Stipple and line.
  - (d) Crayon and colour.
- (3) *The Printing Department.*
  - (e) Proving and printing.
  - (f) Transferring.

*The Engraving Department, Lettering.*—Being to a large extent technical, shall be invariably inaugurated by the student with a given preliminary period of drafting. The rudiments of lettering, the combination of words, sentences, and set forms, shall be thoroughly mastered before the method of engraving is practically demonstrated. This preliminary period must necessarily vary according to the adaptability of the student, and should be left entirely to the judgment of the instructor.

*The Engraving Department, Ornamental.*—Being the artistic subdivision of the department, should be treated in like manner. A preliminary period of drafting in design, the arrangement and application of rudimentary forms from standard works on ornamentation, their combination with lettering, etc., shall precede the practical period of engraving.

*The Crayon Department, Stipple and Line.*—This method, as well as its concurrent method, shall be open only to students who have passed through a regular course of training in freehand and mechanical drawing. It is of the utmost importance that form and colour be thoroughly impressed on the student before attempting either of these branches. Colour values shall be particularly understood, because without its important elementary knowledge, all the detrimental features of the present apprentice system will result, and both the *chiaro-oscuro* and colour value will be little understood. The practical demonstration of this method is largely technical, and is the simple application of value in stipple and line methods, of set, form, and colour.

*The Crayon Department, Crayon and Colour.*—Being essentially the most artistic method, shall be open only to students who have passed through a regular course of freehand or mechanical drawing. The uses to which this method is applied are so closely allied to the highest forms of art, that only such students as have evinced a decided talent in any branch of art shall attempt the course. Under present existing conditions many excellent workmen experience the great drawback of insufficient preliminary training in form and colour, and it is an undeniable fact that in many cases the technique of stone drawing has dwarfed latent natural talent. To overcome this peculiar condition, great care in the selection of students must be exercised, and the application of the

student should be accompanied not only by examples of his work, but by a certificate from his instructor when possible.

*The Printing Department, Printing.*—Being entirely technical, prescribes none of the important preliminary study set forth in the various former departments. To insure a successful result of proving the work of stipple and crayon method, the first step should be to impress the simple chemical values of the materials used, and their operation upon the plates under treatment. A perfect knowledge of the treatment of the various classes of lithographic surface drawing will result when the chemical operation is mastered, the subsequent operation of printing from the chemically treated plates being very largely a matter of practice.

*The Printing Department, Transferring.*—This is a very important branch of lithography, and although entirely technical and mechanical, decides the quality of the product of lithography. For, however well the plates may be drawn and chemically treated, however perfect the workmanship may be up to this stage, the transferer can not only produce results differing in proportion and value by imperfect knowledge, but by the variation of material and temperature. No student shall attempt the transferring branch of lithography unless in possession of a thorough knowledge of chemical treatment and a preliminary course of proving and printing. Both of these branches are absolutely essential in the education of a good transferer, and therefore the course of transferring shall be the final one in these departments. The classes for this branch shall be drawn from the proving and printing classes exclusively.

It is advisable that three instructors be appointed, one for each department, but it is possible for a versatile instructor to teach both the engraving and crayon methods complete in their subdivisions.

The course of instruction shall be three years for departments 1 and 2, and two years for department 3. At the expiration of the course, diplomas shall be issued to the classes, and a notice sent to the National secretary that such students having attained proficiency are desirous of obtaining employment.

The properly constituted officers of the National Lithographers' Association shall thereupon send notices to the various lithographic firms, stating the facts set forth, and soliciting the employment of all such qualified students.

As a natural consequence of a thorough and practical training, the pernicious apprentice system now in vogue will be lessened in proportion to the effectiveness and numerical strength of the students who avail themselves of the splendid opportunity offered. The employing classes will be vastly benefited by engaging the services of trained artists, engravers, and printers.

It is the sincere wish of the National Lithographers' Association that the School of Lithography be installed at once in the Drexel Institute, Philadelphia, and to this end the association offers its active assistance in the selection and formation of the corps of instructors and necessary outfit.

JOHN D. AVIL, *Chairman.* ARNO LEONHARDT.  
JAMES G. FINLEY. S. E. PACKARD.

—*American Lithographic Journal.*

## Engraving by Electricity.



THE *Papier Zeitung*, of Berlin, announces a discovery which, if practicable, may possibly entirely revolutionise engraving by the ordinary present-day systems, and particularly those of photographic processes. The subject is drawn on a plate of zinc, which is covered by a layer of bitumen, either by the artist or by photographic means; then plunged into a bath of diluted acid, when it is put into communication with a battery, one pole of which is simply placed in the acid. When the current has been set at work, the acid attacks the metal very quickly, a few minutes sufficing to obtain the required depth, as it is very easy to control the current.

This process is the more preferable to the present methods, as the regulation of the engraving to an exact mathematical depth is easily obtained, whereas in the method of engraving by acid baths the surface of the plate is covered with a pellicle of hydrogen, under which small air-bubbles continually appear, necessitating the constant moving about of the bath, and a constant brushing of the plate. The discoverer believes that the action is due to a polarisation on the surface of the metal. As we take it, the current of electricity is utilised for the production of plates, not by acting directly upon the plate itself, but in the proper regulation of the current, so as to give more or less action direct to the acid. It is noted in this process, that if a plate of metal is plunged into a bath of acid and put into contact with one pole of the battery, there are no bubbles to be seen on the parts of the metal in contact with the acid, and the etching is made much more regularly and quickly than under ordinary conditions. The obviating of these air-bubbles on the surface of the metal is a very important point, because their presence results in unequal biting of the surface of the plate, both laterally and vertically, and outlines lose their effect by the clearness of the design being interfered with; it is this which causes the necessity for the use of the rocking vessel, and the constant use of the brush in the ordinary methods.

A LESSON IN COMPLEMENTARY COLOURS.—A gentleman, whose power of observation is active, recently retired in a room having white walls and ceiling, and furnished with yellow window shades, which were drawn down. He was awakened in the morning by the sunlight pouring in through the yellow shades. The walls and ceiling appeared to him to be of a light green colour. His explanation of this phenomenon was this: The light, in passing through his eyelids, was tinted red; by continual exposure of the optic nerves to red light they became tired, so that when the red screens (the eyelids) were removed by opening the eyes, the sensation of the complementary colour was experienced, and as a result, the walls and ceiling appeared green. After gazing at the ceiling until the green colour had vanished, he closed his eyes and covered them to prevent light from entering through the lids, when a vivid purple, the complement of the yellow or orange shades, was seen.

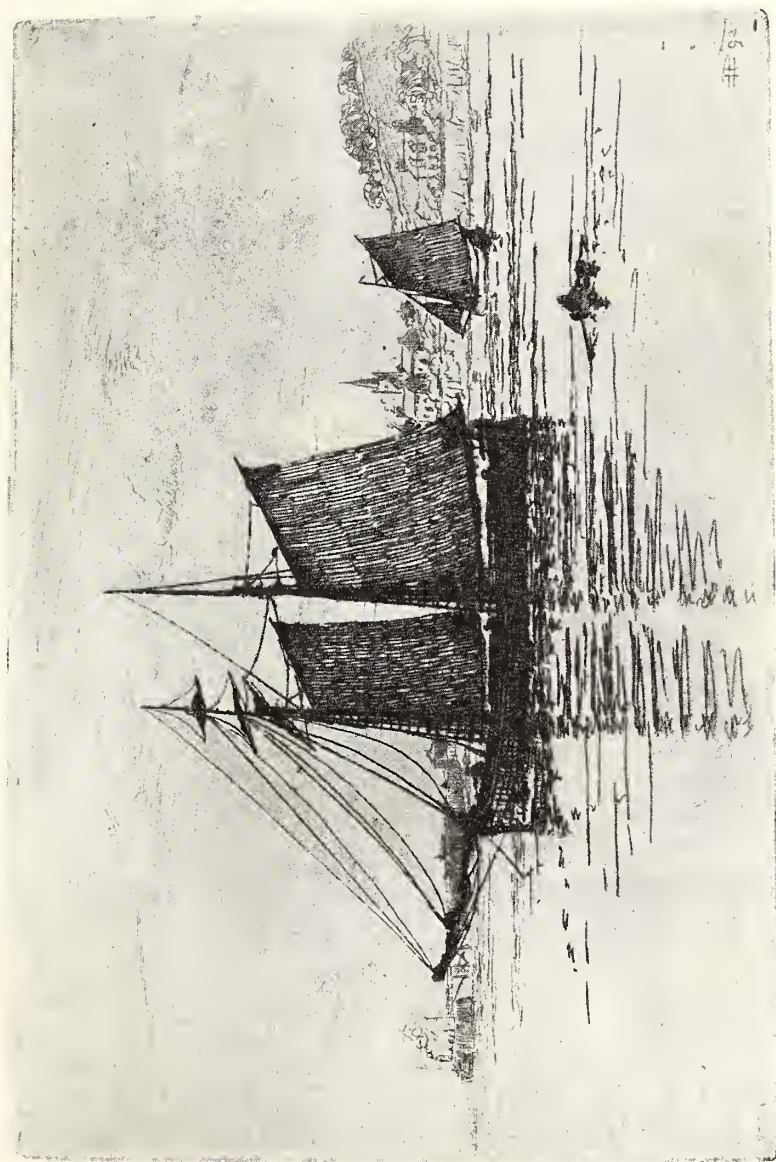


PLATE II.—ETCHING—FINISHED STATE.

REPRODUCED FROM A "FULL" PROOF (TAKEN WITH TONE AND *Retoussage*).







## Etching, Drypoint, Mezzotint.

By HUGH PATON,  
*Associate of the Royal Society of Painter-Etchers.*

### ETCHING.

#### FIRST DRAWING.



THE plate is now ready for the needle work, and may be fixed down in the well of the drawing board. Draw in now only the strong work of the foreground, that is to say, the hull, spars, ropes, etc., of the vessel, with the strong markings of the reflection in the water, and the markings of the small boat in front. You may draw also the outline of the sails for clearness sake, and then shade them in, though they are not intended to be quite as strongly bitten as the rest. And here it is necessary to point out a fact of importance. The lines widen, as well as deepen, under the action of the acid, and you must therefore draw them rather openly in the foreground, otherwise they will melt into one another as they widen, and so destroy the white spaces between, and the consequent freshness and brilliancy in the proof. In shading, you may cross the lines frankly, but avoid running them into one another at an acute angle, like the lines of a fan, because the acid attacks the copper quickest where there is most surface exposed, and while each line remained distinct, there would be an ugly blot at the junction out of keeping with the rest.

"Is it necessary to use much pressure with the needle? I find that the point scratches a little in some directions, but not in others."

That shows that the point is not evenly sharpened. Look at it with a magnifying glass, and see that it is thoroughly round, and then, with the point upon any hard surface, twirl it slightly between the fingers until it will glide evenly on the thumb nail. It is not necessary to use more pressure than is enough to secure that the wax is cut through. Sometimes it appears to be so, when you have, in reality, only removed the smoked surface. Therefore, cultivate the habit of drawing with just that amount of firmness that will secure the effectual removal of the ground, but without scratching the copper strongly. You can hardly avoid scratching it to some extent, but let the pressure be uniform. Wherever the needle disturbs the polished surface, the acid attacks it more quickly, and the result in the proof would otherwise be unevenness of work. Some etchers cultivate the habit of drawing with sufficient pressure to scratch the copper distinctly, in order to facilitate the biting. It is not a matter of consequence to what extent pressure be used, provided it be regular. It is a matter of

individual taste, but you must get rid of the habit of drawing light and heavy as with a pencil. It may be borne in mind at the same time, that a little extra pressure in the drawing will secure a more vigorous biting in any required spot. The few touches of the small boat, for example, may be drawn with extra pressure, because, being isolated from the other work on the plate, they may not bite quite so quickly. You must bear in mind what I have said above, that the acid attacks the copper quickest where there is most surface exposed, and in this subject you may expect the work about the vessel to bite rather more rapidly than the isolated lines on the water. It is only necessary to know this peculiarity of the nitric bath, in order to make judicious use of it, and you may here apply the extra pressure to the small boat, but not to the lines on the water, as the latter are not intended to be so strong in the proof.

I need not point out to you here that you must try to get the utmost expression possible into the lines of your drawing. Every rope in the rigging of the vessel has a bend in it that has a meaning, and these must be carefully rendered. The etching needle renders the expression of the lines of a vessel's rigging in a way that makes the painter despair. You have drawn the main halyard—that line coming from the top of the main-mast to the yard of the sail—rather clumsily, and you must do it again. Take this bottle of special stopping-out varnish, and carefully paint the line out with a fine camel-hair brush. It will dry in a moment, and you may draw it again.

#### FIRST BITING.

The plate is now ready for the first biting. Before submitting it to the acid, you must carefully paint over with the stopping-out varnish the mark of the hand vice at the corner, and any bits about the edge of the plate, such as the marks of the drawing pins, which show the colour of the copper. Otherwise the acid will attack them, and the result will be a series of ugly blots at the edge of the plate mark in the proof. You had better, also, stop out one or two of those lines in the water which are carelessly drawn, as well as the line above the mainsail and one of the lines under the vessels bow, not intended to be bitten. Now is the time for any remedial measures of this kind, for once the plate has been submitted to the acid, a badly drawn line is bitten in, and cannot be erased without much trouble.

It is customary to plunge the plate bodily into the porcelain bath, and, for your complete instruction, we shall do so for the first biting, but I shall shew you presently a rough and ready method of biting, which will dispense with the trouble attending the use of the bath. Before placing the plate in the acid bodily, it is evident that the back of it must be protected, and you must therefore give it a coating of stopping-out varnish. If you intend using the bath, it is well to do this beforehand, as it takes some little time to dry. We shall suppose this done, and the plate lying in the bottom of the bath. This is a stoppered bottle, containing pure nitric acid and water in about equal parts. The room is fairly warm, and rather less acid than water—say two parts in five—will be

found strong enough. In a cooler atmosphere, about half and half would be advisable, because the temperature affects the rate of biting very considerably. With a moderately strong acid the biting would be about twice as rapid in a temperature of 65° Fahr., as in one of 50°. Our bottle has been mixed beforehand, and the slight blue colour is due to the presence of a little copper. Mixed fresh, it is apt to be rather raw in its action; but mixed beforehand, and with the addition of the copper, it works more sweetly. We shall save some of this acid for our next plate, so as to supply the necessary modicum of copper, but this time we have put into it a small pinch of copper filings, and it is in good working order. Now pour carefully into the bath enough of the acid to cover the plate one-sixteenth of an inch or so, and wait results. Almost immediately you will notice that the lines are frosted over with a light grey tint, which presently turns to light blue. This shews that the acid is at work at about the right speed. This tint is due to a series of tiny bubbles which make their appearance all along the lines. You will notice that the bubbling is more active along the hull of the vessel, where there is a considerable number of lines close together. The other lines are attacked more slowly, being more isolated, but the small boat is going briskly, owing to the greater pressure used in drawing it with the needle. Keep removing the bubbles with the point of a feather, so as to let the acid get freely at the lines.

"The smell of the acid is rather strong." Yes, I notice that it makes you cough. Do not stoop too closely over the bath. The nitric fumes are bad for the throat; I have sometimes felt its effects for several days, but that was after biting a large plate in a close room, and without due precaution. A small plate like this can do no harm as long as you work in a well-ventilated room. Use a little care, however.

"How long must this be bitten?" About a quarter of an hour. The strongest work takes about half an hour, but we have the distance to attend to yet. As the time is up, out with the plate, and wash it well in water. You may fish it out with an old needle. You need not fear touching the wet plate with your fingers, provided you put them immediately in water. Beware, however, of the acid touching any wound. Finger stalls are recommended by some, but I prefer to dispense with them; one's fingers are all thumbs with them on! The only bad result I have experienced from neglect to dip the fingers in water after touching the acid has been a few yellow spots about them next day, but as these disappear in gas light, your entrance into society will not be jeopardised, and you need have no anxiety on the subject. Now wash the plate well, so that the acid may be thoroughly removed from the lines, and lay it between sheets of blotting paper. Dry by passing the hand gently but firmly over it, and then replace it in the drawing board.

#### SECOND STAGE.

You may now proceed to draw the smaller vessel and the lines upon the water of the middle distance. That will not take you very long, but bear in mind that any approach to solid colour must be drawn with the lines closer together than in the foreground, inasmuch as they will not be bitten so strongly.

The sail of the vessel tells dark against the light distance, and the shading should be closer than in the sails of the nearest vessel, for the lines will not be so wide when bitten. The stern of the vessel being darker still may have a horizontal line or two passed across the shading to give the extra force required.

And now we are ready for the second biting; but as the sails of the large vessel will be dark enough, you must paint them out with the stopping-out varnish first. They might have been left till now, and shaded in before the second biting, but it pulled together the drawing of the whole vessel better to do that at first, so now they must be stopped out.

Now I hope you are good at figures. It is true it is only a case of simple addition, but without a little care you may find that two and two make five! In etching, you must see the end from the beginning. We have bitten the foreground a quarter of an hour, and we have still about a quarter of an hour for the rest. This must be distributed judiciously. The smaller vessel and the more distant lines on the water should be bitten for the whole of that time, or nearly so, perhaps twelve minutes will be enough; but the distance for not more than half of that. Therefore you must now draw in these only, and submit the plate to the acid in the same manner as before, for, say, seven minutes. That done, it is evident that the larger vessel has been bitten twenty-two minutes, and the smaller one seven. You have still, therefore, a good five minutes to spare, which will suffice for the distance and the sky.

Here you may take the opportunity to restore the acid to the bottle, as we shall not require the bath again. The colour of it is still a light blue, and it is good for further work. As soon as the colour tends to a strong green—which shews that it is becoming overcharged with copper, when it will cease to work—it is better to throw it away, keeping only a portion, for the sake of the copper in it, to mix with fresh. Place the glass funnel in the bottle and pour back the acid, holding the whole over the basin of water, in case of a spill. Always have a basin of water beside you, or the result will be fingers in a chronic state of jaundice. Dip your fingers therein every time they touch the acid.

#### THIRD STAGE.

Now draw in the whole of the distance and the sky. The mass of trees may be shaded with still closer lines than you used in the middle distance. Use parallel lines only in the shaded side of the church tower. If you cross your lines you will get a dark that is too strong and quite destructive of atmosphere. As the land is in light, use open lines, except in the extreme distance across the vessel's bows, where it comes more solid against the sky. Put in also the lines of the sky, and you are ready for the last biting.

Now here I wish you to notice that the distant land recedes to the left, and that there is a consequent difference of value. Also in the sky, the lines high up should be bitten, if anything, more strongly than those lower down. If you bite them all the same you will destroy all idea of aerial perspective. This difficulty we shall get over in the biting. It is one that cannot





DE MONTFORT PRESS LITHO.



be got over in the bath without a great deal of trouble in stopping out by short stages. But by the rough and ready method I have referred to, a graduated biting can be obtained with great ease. Here is our basin of water, and with these two slips of wood placed across it a few inches apart, we can dispose of the plate over the basin, so as to proceed with the third biting without danger to the furniture. It is necessary, however, that the plate should be quite level, and with two or three small wedges of wood and a pocket spirit level, we can adjust it so that the acid will lie upon it without running over.

Had we not been seeking gradation, it would have sufficed simply to pour upon the plate sufficient of the acid to cover the whole of the work upon it; but in the present case, we must use a little precaution. As we require the acid upon the whole of the lower part of the plate, you may pour upon it enough to cover that portion of it. It will not run over unless you pour out too much. What will lie on the plate without running over is quite sufficient for the purpose. You will notice that the acid does not take kindly to the surface of the ground. The latter seems to repel it, and it tends to run in any direction but the right one, and very often overboard. To obviate this difficulty, put upon the plate in one or two places a little saliva, and with a feather dipped in it you can run the acid exactly where you please. This is not very nice, but it is eminently practical. Now guide the acid over the whole of the foreground and distance to the right of the smaller vessel; the rest of the distance can wait for a couple of minutes. Then proceed to the sky. Here is a pipette, which you see is simply a piece of glass tubing with a small rubber ball at one end. Put the tube into the acid bottle, squeeze and release the ball, and the acid will rise in the tube. Withdraw it, and holding it over the top of the plate, lay a band of the acid all the way across, covering the sky to one-third of its depth. With a little saliva ready placed, the acid will be quite docile and go where you wish. This has taken a minute or two, so now pass the acid with the feather over the remainder of the distance as far as the large vessel. You will notice that the distance on the right has hardly begun to bite as yet, though the former work is going briskly. There is no harm in this, as we want the foreground to be fairly strong. I have already hinted to you that the acid attacks the copper quickest where there is most of the surface exposed, a peculiarity that creates no difficulty, provided you are aware of and provide for it, in your calculations of time. But it has another peculiarity, which is that it attacks at once the line which is already partly bitten, while it takes a minute or so to attack the fresh lines, owing to the polished surface being harder than the rest of the copper just below it. If you disregard this, you will probably find your distance under-bitten, and a consequent disturbance of relative value. It is easier to remedy a distance that is over-bitten than one that is under-bitten, therefore bear in mind rather to under-bite in the first biting, as the foreground lines will be in full work at the second biting for a minute or so before the secondary work has fairly started, and both the foreground and

middle distance will take a start of the distance in the third biting. The time is not long, but in a final biting of five or six minutes it is enough to make a considerable difference.

But now that the acid has fairly taken hold of the distance to the right and the sky at the top, you will with the feather edge the acid down another third of the way in the sky, and lead it over the distance to the left. In another minute or so edge it down a little further, and presently over the lower part of the sky, and the whole plate is now at work. Leave it for three or four minutes more and the biting of the plate is finished. I always incline to linger for a minute or so longer than the time calculated, because it is easier to reduce a distance that is slightly over-bitten than to strengthen it, though there is not the same difficulty with the foreground. Until you can quite trust yourself, let the distance be bitten quite enough, and the foreground, if anything, under-bitten. The former can be reduced, and the latter strengthened by re-biting, more easily than when the faults are the other way. But, of course, get the plate as nearly right as possible before cleaning it off.

Now, how does the account stand? Let us see if we have kept our heads. We started with the idea of biting the foreground half an hour, the middle distance a quarter of an hour, or perhaps barely that, and the distance five minutes or so.

	First biting.	Second biting.	Third biting.	Total.
Large vessel . . .	15 . . .	7 . . .	7 . . .	29.
Small vessel . . .	— . . .	7 . . .	7 . . .	14.
Distance to right . . .	— . . .	— . . .	7 . . .	7.
Distance to left . . .	— . . .	— . . .	5 . . .	5.
Lower sky . . .	— . . .	— . . .	4 . . .	4.

This is very nearly as we intended, and for a first attempt at simple addition, which is not so simple as it looks, we have kept our heads fairly well. One's first few attempts, without guidance, are almost certain to be failures. But then we learn by experience, and you had better begin by charging a few plates to "general expenditure." It will cost you a trifle, a few coppers in fact, but you will learn much.

"Then, am I to understand that half an hour is the length of time for the longest biting, and five minutes for the shortest?" Yes, and no. Much may depend upon the nature of the subject. You would not treat a study of delicate roses with the same rugged force as a group of trees. But for a small plate, such as our illustration, in which delicate distance is opposed to a strong foreground, that would be about right, provided that the acid is of the right strength, say two parts in five, and working steadily, but without violence. But for a large plate, with very strong markings, a longer time might be necessary; or for a small plate and a subject requiring delicate treatment, twenty, or even fifteen minutes might be more than enough. Then again, the action of the acid is so much affected by temperature that time alone cannot be taken as a sure guide. It is the result of my experience that you must rather take into account the rapidity of the action of the acid as shewn by the ebullition, and supplement that by a good look at the plate between the bitings, or even in the middle of one, in order to judge how the work is progressing. One of the most difficult things in etching, as in other



things, is to know just when to stop. By far the best test of progress I know is to hold the plate up to the light, nearly level with the eye, so as to get the reflection of the light on the untouched surface, and *see the shadows in the lines*. With a little practice, turning the plate about so as to look across the lines of any part of the work, this gives a wonderfully correct idea of what the strength of the work on the plate will be when printed. You actually see the design in black on white. Until I was shewn this method by Mr. Menpes, the well-known etcher, I was always more or less at sea; now I feel comparatively safe.

Test this with the plate we have bitten. If you hold it up in the right way, you see quite distinctly the strong lines of the vessel's hull, as well as those on the water; also those of the middle distance, not so strongly marked. The distance and sky are delicate, but quite distinct. The shading of the sails of the large vessel is not too strong, because you are looking along the lines instead of across them, and do not see the shadows. Turn the plate, therefore, so as to look across the lines, and the sails show strong and black at once. They look now as if they would print too heavily, but we shall see. The smaller vessel also shews more distinctly from this point of view.

"You said just now that the distance should rather be over than under-bitten, but that the foreground should err, if anything, on the other side. What is the reason of that?" Well, let us suppose that this distance had been over-bitten; we should have proceeded to polish down the whole surface with a stick of charcoal and oil. That would have reduced it soon to the strength required. On the other hand, if the foreground had been weak, we should have re-grounded the plate without filling the bitten lines, by a method to be presently described, and carried the biting further. Of course, the foreground, if over-bitten, could be reduced with charcoal in the same manner as the distance, but when the work is so much stronger this is a matter of considerable labour. Another method of reducing over-bitten work is by the use of the burnisher. The pressure tends to crush in the edges of the line, so that it holds a smaller volume of ink. The reduction, however, by this method is not very great in strong work, though it acts well enough for a little bit of distance. But it has the disadvantage, by crushing in the edges of the line, of destroying its purity of expression. For these reasons, it is better to keep the biting of the foreground well within bounds, while the distance is firmly bitten; but, I need not repeat, aim at getting your plate as right as possible at the first. To reduce a bit of strong biting it is better to use the scraper carefully until the surface is sufficiently lowered, and then to use the burnisher lightly, so as to polish the surface without crushing in the lines. Now let us see how all this will apply to the subject of our illustration.

The plate is now ready to be tested, so clean off the ground with turpentine, and take a good look at it. Now that the ground is removed, you can form a much better idea of how it will print than it was possible to do beforehand. It is in knowing just when to clean off the ground that the real difficulty lies.

[To be continued.]

## Reminiscence of Mr. Barnum.



ONE of P. T. Barnum's successful feats of bamboozlement, said a New Yorker the other day, was played upon the Canadian customs authorities. The veteran showman's tours were always planned far in advance, and one winter he made up his mind to take his great circus and menagerie through Canada during the summer after the next. This gave him about two years in which to mature his plans. One important item of a showman's expenses consists of his advertising placards, and Mr. Barnum was always lavish with these gaudy prints. He was aware that the Canadian Government imposed a high duty on this class of imports, and yet he wanted to paint Canada red, yellow, blue, and green, with a lavishness that no showman had ever displayed there before.

Now, there was no printing house anywhere in Canada that could begin to turn out the kind of work Mr. Barnum required, either in size, colour, or finish. Nevertheless, his immense posters came under the same classification as much smaller lithographs and printed coloured matter did, and he knew that the Dominion customs authorities would not abate one jot of the toll, but would rather rejoice at the opportunity to mulct the foreigner, who would convey so much money out of the country where it is badly needed.

So Barnum studied the question awhile, and finally sent on at once a great lot of circus posters of the most gorgeous designs, whereon yellow lions clawed striped tigers and brown bears fought blue hippopotami till the gore flowed into beautiful crimson backgrounds. The posters were, of course, detained by the Canadian custom officers to pay the duty. They were accordingly held for twelve months, and, no agent appearing, then duly advertised for sale for three months more, and finally put up at auction with a lot of other unclaimed parcels, and were designated in the catalogue as "coloured prints." Nobody took any interest in them when the auctioneer called for a bid, and finally the whole batch was knocked down for a song to a secret agent of the circus who had been sent up by Mr. Barnum for that express purpose. He thus astutely succeeded in getting his lithograph posters through practically free of the high duty.

"WHAT IS ART? Science at least is definite," dropped from the lips of a well-known figure in photographic London and provincial circles. The prudent man nowadays is cautious of his answers, lest the scientific expert analyse and dissect them until their authors would not recognise them. So we answered nothing and stepped not into the breach, where even angels might fear to tread. Truly science is definite, and perhaps the very difficulty of defining art is, in some measure, an essential characteristic of that which is born of imagination, and aims at the intangible ideal. But the man of measures and equations will find more delight in Euclid's diagrams than the precious suggestions of the artist's sketch. For him is the definite and real, he should beware how he sully by his touch the robe of the ideal.—*Amateur Photographer.*

## Crayon Drawings by the Mezzotint Method.

... II. ...



Continuation of the article upon Crayon Drawings, or Mezzotint Lithography, given in our last issue, the American *Lithographers' Journal* publishes further details. These further details add considerable interest to the process, in so far that it becomes apparent that this method has special features in enabling an artistic draughtsman to produce drawings having greater vigour, and at the same time allowing the execution to be carried out much in the same style as a painter works upon a canvas.

The peculiarity of the process is a novel innovation in the tool used. The latter is the invention of M. Tudat, called an *égrainoir* (which may be considered a "grainer" or picker), consisting of a bundle of fine wires sharpened to different degrees of fineness. The wires should be fine steel. The finer and longer, the better will they work. This wire grainer is made into the same form as an ordinary sable brush; and to make it, anyone with the least ingenuity need not have any trouble. The holders for the wire bristles should be metal cases, similar to slate pencil holders. The number of steel wires required may be first determined by forcing as many into the holder as it will take; then remove the bundle, and take one half of the quantity thus measured. The wire should be that known as No. 12 Nuremberg cord, and should be cut into lengths of about  $2\frac{1}{2}$  inches. The half bundle of wires must be then bent double, to form a bundle  $1\frac{1}{4}$  inches long, large enough to just fill the holder when forced in. The bundle requires forcing into the holder about  $\frac{3}{4}$  to  $\frac{1}{2}$  inch, and well fastened by a ferule or by wire binding. From the projecting  $\frac{3}{4}$  inch about  $\frac{3}{16}$  to  $\frac{1}{4}$  inch must be cut off perfectly sharp to leave all the bristles the same length. This done, the bristle grainer must be sharpened upon a whetstone to give it a conical form. The grainers can be made of different sizes by using larger or smaller holders; and some may be flattened by hammering the holders when the bristles have been set. To those who use these tools many points will suggest themselves for fastening the bristles, fixing, and shaping, which it is needless to dwell upon.

These grainers are sharpened upon a good levant stone, sparingly smeared with oil from a sponge. Too much oil tends to get into the grainer and ultimately stain the stone.

In use, these grainers get clogged with particles of crayon, which must be regularly pressed out after every few strokes by running a finger-nail down the grainer, whilst the latter is held inclined upon a cloth-covered card or board. This operation will soon be understood when using the tool, and the draughtsman will learn that unless regularly cleaned the grainer will require heavier pressure in usage, resulting often in forcing the grease into the grain rather than lifting

it out. To work quickly with a grainer the heat developed will melt the crayon into the stone. Again, when the stone has a pitted surface, or the tool is held too upright, it frequently happens that some of the bristles catch and bend outwards. These should be cut off, to keep the brush as straight as possible. The draughtsman must study the method of using the grainer, and he will soon acquire a steadiness of handling which will enable him to make a forward and backward stroke exactly over the same lines. If this be not done, the bristles are liable to become bent.

Having dealt with the manufacture and repairs of the grainer, the next point is its application. In the article in the last issue the main feature was using strips of blanket to wipe out crayon tints. This grainer is intended to supersede the blanket, or, perhaps, rather to add another process to lithography. Whilst the rubbed tints produced by the blanket excel in their extreme softness and blending, the tints produced by the grainer are full of vigour, and do not partake of that evenness of fine flat tinting which characterise the rubbed tints. But the quality of these tints is higher than rubbed tints, and with the grainer a far greater amount of finish can be put in than with the blanket.

The crayons used must be soapy and friable, rather than greasy and soft. They should not contain any gum lac, and should be well baked. The number of different grades of crayon can be restricted to two or three. The crayons used being less liable to grease the stone by lying any length of time upon the surface, they may be used at the outset to cover the whole portion to be tinted rather than working the crayon on as required when rubbing tints in.

The point to be aimed at, when commencing, is to lightly cross-hatch the stone all over, touching only the points of the grain, and thereby putting evenly upon the points just sufficient crayon to fill the grain when it is dragged or drawn from the points into the grain by the next operation. The amount of crayon must not be in excess, and where the grain appears light a little more should be worked on. In chalking, it should be remembered that it is unnecessary to aim at absolute evenness at first, as that will be obtained by the grainer. The points of the grain thus loaded with chalk are robbed of this supply by using a stonemason's boaster (chisel, 2 inches broad), which is held upon the stone firmly and drawn across in an inclined direction, under a heavy pressure. The boaster is used in different directions across the stone, until the whole grain has become filled with the chalk previously on the points of the grain. This result may also be obtained by dissolving some soapy crayon in turpentine and rolling it well into the grain. The ink should be thick, and if it dries too quickly add some evaporating oil, such as oil of lavender. The process is easy, but not so reliable as the method of chalking. The grain thus filled is ready to be worked upon. The drawing is traced down or sketched out by a steel point, and the working out by the grainer is commenced. With the grainer resting on its bevelled side, the draughtsman pushes it from him under gentle pressure, and draws it back along the same path. In the forward movement the grainer cuts out the chalk



and holds it amongst its bristles, at the same time producing scratchy lines, which, in the backward movement, are to a large extent re-covered. These scratches are not of any importance, as they finally become part of the work and comparatively disappear. The grainer is continually kept clean and in good repair, whilst the tints are worked down to the required fineness. By using rounded or fine grainers large and small surfaces can be effectively worked out, and the drawing almost, if not entirely, finished. Much of this tinting can be worked out rather roughly, the draughtsman not aiming at clean tints all at once. It is only when the chalk has been worked down to finishing point that it is necessary to use clean fine grainers to finish and shape the tints. If a fine grainer cannot be manipulated to finish with, then a stiff steel pen without a split can be used, like a pointed chalk, to work up even the finest details from the blackened surface. Heavy patches of shade can be put on in the usual lithographic way with litho writing ink and the brush, and with a soft greasy crayon further finishing details may be added.

Doubtless many readers will wonder at the complexity of this process, and ask why it was invented whilst such excellent results are obtained by ordinary chalking. It is difficult to justify its introduction, except to show the curious and novel way in which our foreign competitors obtain results slightly in advance of previous productions; and in which the touch of the painter's brush can be more truly depicted, together with the advantages of obtaining a greater display of vigour and artistic skill.

ROYAL PORTRAITS.—Some little excitement has been created on the Continent by the sudden disappearance from his home for several days of a young German prince. In England every one is now so familiar with the portraits of the members of our royal family, that one is inclined to wonder how any member of a foreign one would not be at once recognised wherever he went—at least, in his own country. On the Continent, particularly in Germany, we are informed, photographs of royal personages are not so common as they are here. Evidently sittings from them are not so easily obtained, or photographers are not so enterprising as they are in this country. There may yet be another reason—royal portraits are not in such great demand abroad as they are in England.

THE first impression of a painting of an open-air subject should be light. If it be true to nature in its first impression, its principal fact, it should be lighter than the chamber wall it hangs upon. It should seem as if through an opening in the wall one saw the scene depicted—as though one could breathe in through it the air and freshness of things unconfined.—F. BATE.

ALTHOUGH there should be a principal light or principal dark in every picture, this light or dark should not stand alone. No light should be allowed to be single or isolated, but should be reflected or echoed—not in its full force or quantity (there should be no rival near the throne)—but in inferior degree.—H. P. ROBINSON.

## A Theatrical Printing Combination.



A GREAT number of the strongest litho show printing companies throughout the United States, have come together in a combination for the purpose of mutual protection. There was a meeting of the representatives of these companies in New York recently, and steps were taken which will have a tendency to place the theatrical business upon a higher commercial footing than the one it has hitherto occupied. Under the laws of this association no member can execute an order for printing from a person who is indebted to another member.

Thus if a swindling manager owes the Cincinnati *Enquirer* a large bill for printing, he cannot secure a sheet of paper from the National Printing Company or from any other concern that belongs to the association. At stated periods there will be circulated among the members of this combination, a pamphlet containing the names of all bad debtors, and special reports concerning the financial standing of any applicant for printing will be sent out from the central office in New York, whenever it is asked for by any of the houses belonging to the association.

The new institution shows once again that the tendency of the time in the theatrical business, as well as in other pursuits, is toward the closest concentration and centralisation. The tendency has made itself felt in various forms. It is not so many years since a manager of a combination who wanted to book time through the country, found it necessary to send out hundreds of telegrams and letters to the various theatres along his proposed route. In those days the booking of an ordinary tour frequently occupied the entire time of an energetic manager for three or four months. All this is done away with. The building up of the great exchange business by Klaw and Erlanger has made it a simple, brief and straightforward thing to book any sort of a route in any part of the country.

This movement on the part of the printers is similar in its way. It will tend not alone to the protection of the printing houses, but to the improvement of the character of the theatrical business. The petty thieves who have sometimes masqueraded under the title of theatrical managers will find it impossible to secure the machinery without which their operations cannot be continued. If one of them swindles one printer the other reputable houses will know it and will prevent him from continuing his depredations.—*Dramatic News.*

THE COLOUR OF THE SKY.—According to a contemporary, M. A. Crova has made a series of researches on the diffusion of light by the sky, and has come to the following conclusions:—The blue colour of the sky reaches its maximum intensity in December, January and March, and the minimum in July, August, and November. The maximum effect appears in the morning, and the minimum at the time of the greatest heat of the day. The intensity of the blue colour is at its maximum in winter, and at its minimum in summer.





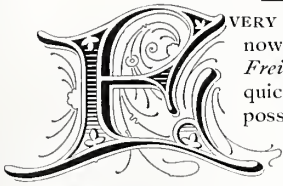
*Faithfully Yours  
Fred. C. Cunningham*



Complement To the  
British  
Lithographer



## To Obtain Lustre in Litho Printing.



EVERY lithographer is compelled, nowadays, says a writer in the *Freie Künste*, to produce his work quickly, and still as perfect as possible. The fulfilment of these requirements is somewhat difficult, because hurrying of the work may mean poor results; while on the other hand, aiming at perfection may seriously retard the completion of the job. It is of first importance to use none but the very best inks, because only in this way is it possible to produce good work.

In order to give lithographic colours lustre and depth, two ways may be employed. The first and oldest consists in printing the matter first with other colours and then printing a second time with glazed colours the places which are to be lustrous. This process, however, on the score of time, can only be used for jobs which are well paid for. The object of the second method of obtaining the desired result is to make every colour appear effective, and produce a striking piece of work with as little trouble as possible. For this purpose, the colour must be prepared with regard to the end to be obtained. It should be pulverised before it is ground, and then ground with as weak a varnish as the grinding machine or roller will permit. If the colour is ground too fine, it is not possible to produce the required lustrous depth. In this case, an addition of dry colour may overcome the difficulty. Colours ground in this way may generally be thinned down a little, according to the nature of the work to be done, in order to be fed more easily. The quality of the colours must also be taken into consideration, because some of them dissolve easier in water, and consequently show upon the damp rollers and the sponge and on the paper. In order to thin down deep and lustrous colours, a few drops of petroleum may be added. This contains less grease and produces greater consistency than other fatty substances, and for this reason a colour treated with it can be more easily used in rolling up. It is, besides, more quickly absorbed by the paper, and there is consequently no delay in drying. Such impressions in deep colours may be interlaid with slip-sheets of rough paper, and the work need not be delayed for a minute.

If it should happen that some colours follow each other before becoming dry, a little Bologna chalk will be of great assistance. The use of this chalk permits the printing of different colours upon each other, makes the contrast between them more prominent, and prevents the sheets from sticking together. It therefore allows the rapid execution of all kinds of work. In order to give the colours the desired lustre in printing, they should be ground in the way explained above, but for specially brilliant lustre, a stronger varnish should be used in preparing. In certain kinds of work, *i.e.*, in imitation of photography,

the lustre is produced by printing over the whole picture a tone colour consisting of strong varnish and the addition of siccativ. As a matter of course, impressions obtained in this way must be hung up while the printing is going on, in order to prevent sticking. When they are dry, dry siccativ should be employed, as the liquid contains too much adhesive matter.

Primary colours, as red, green, blue, yellow, and black, or composite colours, like purple and brown, if special lustre and depth are desired, require a specially selected paper. The colour must not permeate the paper, and therefore the latter must be strongly glued. Upon chromo paper the colour does not remain unless a ground has been printed first, and for this reason it is usually not to be recommended.

The inks for printing are thinned down with medium strong varnish and Japan varnish. The Japan varnish may be prepared with strong varnish and liquid siccativ, and the addition of a trifle of dry siccativ. The principal quality of the latter is that it dries very quickly and does not adhere. It has, however, no lustre but that produced by the varnish.

As a matter of course, special attention must be paid to the rollers if such colours are used. It is important that the inks dry quickly, but they dry just as quickly upon the rollers, and the latter should therefore be frequently washed or rubbed with varnish.

The impressions made in the manner described should be covered with rough slip-sheets and placed upon the drying racks. The better way is, of course, to hang them up, but this manipulation requires much time. It will, therefore, very seldom be possible to employ it; but if it can be done, it repays the trouble.

Another way of giving a lustre to impressions is the following:—After the completion of the job, and when the impressions are dry, they are brushed with a little magnesia until the colours show the desired lustre. If it is not advisable to employ a brush, a piece of flannel may be folded together, dipped into the magnesia, and the impression rubbed, always in the same direction, until a beautiful and equal lustre is obtained.

CONVERTING BLUE PRINTS INTO BLACK PRINTS.—The *Revue de Chimie Industrielle* says that the prints should be first passed through water acidulated with nitric acid, and thence into—

Carbonate of soda .. .. .	50 grammes.
Water .. .. .	1 litre.

In this the picture is changed to an orange tone, when it is removed and placed in—

Gallie acid .. .. .	50 grammes.
Water .. .. .	1 litre.

Subsequently washed in water acidulated with HCl.

ENGLISH artists have studied and painted in Japan, and collections of modern Japanese art have been seen in London, yet probably our British public hardly realise the degree of cultivation at which the artistic mind in the far East has arrived. By those who are in the best position to judge it is admitted that the standard of taste is there higher and more refined than in Europe, and hence it is with no little curiosity that the promised exhibition of photographic pictures in Tokio next year will be awaited.





## A Leaf from the Frenchman's Book.

A. VALETTE ON PHOTO-LITHOGRAPHY.



POITEVIN, a pupil of the Central School and an engineer at the State Salt Works, appears to be one of the most ingenious, and at the same time one of the most eager propagators of photo-lithography. By his different reports to the Academy of Science, in 1848, 1850, 1851 and 1854, we can follow all the progressive improvements he made in this important branch of lithography. Other investigators, among them Niepce de Saint-Victor, Guymet, Moock, Lemerrier, Lerebours, etc., have devoted a part of their lives and fortunes to these new applications of photography. If the results heretofore obtained are not what we had a right to expect from such great intelligence and activity as those displayed by the several practical men we have just named, we should only blame our rather too exclusive French character, which never knows how to profit by the beautiful inventions and innovations due to our countrymen, and which has once again permitted our neighbours, the Germans, the Austrians, the Belgians, the Swiss, etc., to surpass us in their large lithographic establishments, where there is almost always found a photographic workshop. When shall we rid ourselves of this archaic routine? when escape from superficiality and half-way measures, and, marching openly ahead on the road of progress, avail ourselves of the resources offered to us by photography combined with lithography? When shall we see among us respectable lithographic houses, attaching to their workshops capable photographers and investigators, who would become familiar by a daily contact with all the strings and manipulations employed in lithography? We should like still better to see the principles of photography inculcated into the mind of every young and earnest lithographic workman. Such means, although very tedious, are not impracticable for privileged minds, and it would not then be necessary to combat the sort of antagonism which causes both of these specialists to blame each other for the failure of their works. We have, however, been able to ascertain that when the photographer handed us a proof well taken, on paper properly prepared by the gum or gelatine processes, we had very little trouble in making our transfers successfully, and we conclude from this that the greater part of the responsibility for obtaining good photo-lithographs belongs to the photographer.

A photo-lithograph, properly so-called, may be obtained in two entirely different ways:—

(1) By the direct process; that is to say, by submitting a grained stone (the same as for crayon work)

to a bichromatised preparation, and then exposing it directly to the sun. (2) By the process of transfer; this latter can only be applied to pen-work, engravings, or crayon work, the reproduction of which is desired.

We never had the occasion to try the first of these two modes of procedure, and shall, therefore, confine ourselves to giving a description of it, such as it is taught by Poitevin. As to the second, with which we have experimented, and from which we have obtained splendid results, we will give the different means employed by skilful practical men, adding thereto our personal experiences. Our researches just at present have for their object a process of photo-engraving on stone, imitating very closely the results of photo-engraving on metal, from which good transfers are obtained with difficulty only, and these the lithographer has a great trouble in maintaining intact. We will, later on, return to this process, which might at first sight appear very costly, but which, worked on a large scale, would not by any means reach the price of photo-engraving on metal, since the stones can be used indefinitely, whereas the zinc employed, after it is once cut up and bitten by the acid, becomes useless, as the cost of returning it to the state of receiving a new composition would almost equal the price paid for this metal. With the stone there is, moreover, the advantage of easily making transfers which, if well prepared, will give splendid results in printing.

*Poitevin's Process.*—Take a very close-grained grey Munich stone, dress it well by properly graining it, file and pumice it; then grain it again, the same as if it were to be used for lithographic crayon work; wet it with well-boiled rain or spring water; remove the excess of water by properly wiping it with a very clean rag; the stone being simply damp, pass over it with a badger a bichromatised mixture composed of the white of an egg, well beaten, strained through a piece of linen, and mixed with an equal volume of a saturated solution of bichromate of potassium or of ammonia. Clean the borders of the stone with a damp sponge; remove with a dabber of very soft linen, without rubbing, but by dabbing, the excess of this mixture; then remove the excess of the liquid in the same manner with a dry and very fine linen, so that the finger will not get wet by touching the stone. By this operation only a very small quantity of the bichromatised mixture should have penetrated the stone, forming therein a very regular interior layer, without covering its surface.

Without waiting for this layer to dry completely, apply to it the photographic plate, if it is on paper (or film), and hold it there by a glass attached thereto with little balls of *modelling wax*; if the photograph is on glass, attach it in the same way with wax. You may also use a frame, in which the stone is placed and then covered with the negative plate, but the mode described above is generally sufficient.

Expose the stone thus prepared to the direct light of the sun, placing it so as to make the latter fall perpendicular on its surface,\* or to the diffused light, placing the stone horizontally. The time of exposure is very variable; in summer it is ten to twelve minutes

\* A slight inclination will not do any harm and may be preferable. We prefer a box or tube printing arrangement.

in the sun, and in winter from an hour and a half to two hours; in the shade this exposure should be four or five times longer; the range is, however, great, and it is always better to expose a little too long than not sufficiently, because the excess of exposure can be corrected by the operation of inking the stone, by the acidulation, or by the making-ready; whereas a deficiency of exposure prevents the adherence of the greasy ink in the half-tones, and this cannot be remedied.

After exposure to the light the stone is carried into the inking workshop, where it is left for some time until it is cooled to the temperature of the surrounding air.

Wet with a sponge dipped in a mixture of one-third glycerine and two-thirds water; then, after having removed the excess of this mixture, make a mixture of half transfer-ink and half good litho writing-ink; put the size of a hazel-nut of this mixed ink on a very finely grained roller, distribute and ink, taking care to pass the roller in all directions; the drawing should appear and come out gradually, the parts which have received the action of the light taking the ink, whilst the others, corresponding to the blanks of the drawing or opaque parts of the negative plate reject it; continue the inking, wetting the stone with ordinary water until the drawing has acquired the desired vigour. In case the drawing, owing to getting dry whilst rolling, or to the roller having too large a quantity of ink, should appear too much charged, wash out with turps, wipe, wet and begin again the operation of inking, moderating it, and above all, then employing only No. 1 writing-ink in very small quantity.

Allow the stone to rest about twelve hours, in order to give the ink time to penetrate its pores thoroughly; gum it and let it stand awhile under the gum. After this time has elapsed, wash with clean water, then ink with the same ink as named above, and apply a slight preparation (only three per cent. of nitric acid), gum again and let dry; then take a proof, as if it were lithographic crayon work.

If the exposure to light had not been sufficiently long, the greasy ink would adhere with difficulty, and the proof would be wanting in half-tones; too long exposure would produce a diametrically opposite effect, the drawing obtained would be too heavy, and it would be easily filled up; but in most cases a good proof is obtained, as there is a wide range in the time of exposure if the lithographer is skilful in the development. Nevertheless, it would be preferable to commence over again rather than deliver an imperfect stone to the printer.

The grained roller sometimes deposits too much ink, and from this fact the prominent parts of the drawing become easily overloaded, the contrary being the case with the half-tones, which have a tendency to run thin; after inking use a gelatine roller, which has a tendency to clear the prominent parts of the drawing, inking at the same time the half-tones.

Another of Poitevin's processes consists in using a positive image to obtain direct reproductions on stone, by utilising the following mixture, which has the property of becoming hygrometric under the influence of the sun-rays or the electric light.

Dissolve on the one hand 339·5 grains of perchloride of iron in 2½-oz. of water.

Dissolve on the other hand 123·45 grains of tartaric acid in 2-oz. of water.

Filter these two solutions and mix them by adding 2½-oz. of water.

Cover over the support selected (the stone) and leave in darkness to dry spontaneously.

Other talented men have made preparations to sensitise the stone, but the results obtained are unfortunately not entirely conclusive, although almost all have had an approximate success, especially upon zinc. We think ourselves bound to cite the names of these investigators, if it is only to keep the good record to which they are entitled among all the lithographers who are lovers of progress. MM. Guymet, Rodrigue, Motteroz, Cutting & Bradford, Gobert, and Halleur. We will not undertake the description of the different means employed, which scarcely differ, except in the preparation of the sensitive layer, and we will come to the various modes of procedure employed to obtain the reproduction, by photography, of every drawing, or pen writing, or black crayon, or a deep colour.

#### PRODUCTION OF TRANSFERS.

The transfers are obtained by two very different processes, which we shall call the gelatine process and the gum process, these two products being the principal ingredients which enter into the different compositions used. We will begin with the gelatine process, and examine the means employed and those from which we have obtained the finest results.

#### THE FORTIER PROCESS OF GELATINE PAPER.

*Preparation of the Gelatine.*—The gelatine used must be very pure, and of excellent quality. Soak it in cold water, being careful to renew the water several times until it has swelled entirely. Melt it in a *bain-marie*,\* adding to it afterwards a few drops of ammonia and the white of an egg diluted in 17½-oz. of water. Use a wooden spatula to stir this mixture continually and vigorously, slowly pouring in some water. After two or three minutes of this slow cooking, bring it to a quick boiling, which should not exceed three minutes. Filter in paper, holding the filter over a slow fire to keep it in the liquid state, then pour into any receptacle, where it is allowed to dry. Then cut it into pieces and wash in rain water; spread it to dry in a very dry place, where there is no dust, and then keep it in a hermetically closed jar. You may prepare any quantity of gelatine paper desired, as it keeps perfectly well, and you can easily sensitise about the quantity of paper needed, because the sensitised paper can only be kept in good condition for four or five days.

*Preparation of the Gelatine Paper.*—Melt, in the *bain-marie*, 1543·23 grains of purified gelatine, in about 3½-pints of water. When the dissolution is completed, add to it fifteen drops of rectified glycerine. This addition of glycerine is recommended because the product has the property of preserving a certain freshness in sizing. Several means are employed to

\*An earthenware jar, placed in a saucepan containing water, which can be kept boiling without spilling over into the jar, serves exactly the same purpose.



spread the layer of gelatine over the paper. Some skilful experts use the brush, but it is necessary to have long practice to obtain a pretty result. We would advise making the paper slightly humid, and float in a basin where the melted gelatine should be kept a little warm to prevent it from coagulating. This manipulation is rather delicate, as care must be taken to avoid the formation of air bubbles when raising the sheet, which would produce as many holes in the thickness of the gelatine. The layer given to the paper should be neither too thin nor too thick. Practice will enable the lithographer to know exactly the thickness required to obtain good work. We give, as the proportion of thickness to be obtained, the following means: Take as support for the gelatine a sheet of paper of extra quality. When the sizing has been successful, paper of the strength of 22-lb. post-demy should represent exactly the strength of the square of 31-lb. to 33-lb. In packing up the paper thus gelatined, keep it scrupulously clean in a very dry place, without letting, however, the temperature exceed 53°·6 F. to 59° F.

The paper thus coated is then sensitised, and for this operation we have several processes, but we shall only give the two which we think are preferable.

Water .. .. .	23,142 grains.
Chloride of sodium .. .. .	385'7 "
Bichromate of potassium .. .. .	77'4 "

If we give the first place to this solution, it is because it has a desirable quality for every beginner—that of being very slightly sensitive, thus giving to the lithographer, little familiar with the inking of the proofs, ample time to ascertain by daylight the different phases of this inking, to which we shall very soon return.

The following is the composition of the second sensitising mixture for the bichromatised papers:—

Water .. .. .	23,142 grains.
Bichromate of potassium .. .. .	694'56 "
Ammonia .. .. .	15 to 20 drops.

This composition requires the inking to be done in the dark room,\* where no direct light should enter.

The following is the mode of procedure with the two compositions which we have just given:—Take a flat basin and pour into it either of the above solutions; then dip the gelatinated paper entirely in it, with the sized side upwards, and if small air bubbles are formed on it, it is indispensable to remove them by means of a scraper or large spatula, or even with a brush; in taking out the sheets, spread them in the dark room to dry completely and as fast as possible; it will be even necessary to warm the apartment a little, as the drying must be effected within eight or ten hours at the utmost.

*Printing of the Proof.*—The paper having been gelatined and sensitised, proceed to print the proof, to accomplish which it is necessary that the plate be completely opaque in the negatives, without which no good results will ever be obtained; have care to pack well your frame underneath with several folds of paper, for preventing the passage of air, and to insure at the same time a good pressure on the plate and the bichromatised paper.

\* Dark room is a room the windows of which are covered with yellow, orange, or red blinds.

Ascertain exactly the time of exposure necessary to obtain good transfer proofs by slightly raising a part of the proof; if the drawing or the letters are perfectly visible on the proof in tones slightly brown, discontinue the exposure. Several practical lithographers ink this proof immediately in a red light, using a gelatine roller charged with transfer-ink. The inking must be very light; pass the roller regularly and slightly in all directions until the proof shows a beautiful deep brown colour, without the layer of ink being, however, too thick, as the drawing must be clearly seen through this layer. Other practical lithographers ink their proofs by making the black table on a pumiced stone; the proof is then laid over this layer of ink and submitted two or three times to a pressure to make the lithographic ink adhere to the photographic proof. When either of the two operations we have just given is effected, plunge the paper thus inked in a basin of cold water for ten to twelve minutes, to allow the bichromatised gelatine not made insoluble by the sun's rays to swell, and thus form a humid relief, whereon the lithographic ink therein deposited, either by the roller or by pressure on the black table, having no longer a substantial and attractive support, is decomposed and removed by the slightest wiping with an old flannel dabber, or by a few slight passes of the lithographic roller.

We have often had occasion to employ these two modes of inking the photographic proofs, and we are compelled to recognise that the results were not what we had a right to expect from the very good proofs which the photographer delivered to us. In the first of the two modes of inking we have just given, according to the Fortier process, whatever the ink used, it is very seldom that the lapse of time the inked proof remains in the cold bath does not decompose it slightly, considering the small quantity of it to be laid, and the little attraction retained by the part or the drawing which has been exposed. We recognise, however, in the first mode of inking a great superiority over the second, and every sensible lithographer will assuredly be of our opinion, as the ink deposited by the lithographic or gelatine roller leaves always much more greasy matter on any kind of paper than is fixed on it by pressure. Scarcely had the proof been in the bath and, to facilitate the dissolution of the ink, had we raised the basin slightly from right to left, when our proofs were almost completely stripped off (disgarnished). If, by inking with the roller we obtained some good results, with the inking by pressure the results were all but negative.

[To be continued.]

ROSSETTI'S FAVOURITE COLOURS.—Here is one of the "Sentences and Notes" published in Rossetti's "Collected Works," which the London *Academy* pronounces of peculiar interest: "1886.—Thinking in what order I love colours, found the following:—

- "1. Pure light warm green.
- "2. Deep gold-colour.
- "3. Certain tints of grey.
- "4. Shadowy or steel blue.
- "5. Brown, with crimson tinge.
- "6. Scarlet.

Other colours (comparatively) only lovable according to the relations in which they are placed."



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## Manders' Pomade.

**S**INCE the recent introduction of a soft pomade by M. Trochard, of Chartres, which was favourably noticed in No. 6 of this journal, the well-known firm of Messrs. Mander Brothers, of Wolverhampton, have turned their attention to the manufacture of a very similar article, and have succeeded, after very few experiments, in producing its exact simile. Many of our readers may have all the qualities of pomade emolliente fresh in their minds, and to them we say, that which is true of the French pomade is equally true of the English pomade. But, since the close of the first volume of this journal, the increase in its circulation has been so considerable that it is our duty to our new readers to dwell upon the qualities of the pomade under notice, and ask the forbearance of some of our older readers.

In all the runs of lithography, difficulties of greater or less moment are met with by the machineman as well as at the press, but perhaps there is nothing which gives so much trouble to the machineman as his varnish. In one case, a soft slow drying colour is used; in another, a quick drying colour; now a thin varnish must be used, at another time a stiff varnish is the only one which will give the necessary result; and most printers have to contend with the innumerable difficulties of working bronzes on all kinds of paper. Anything, therefore, which will step in and reduce all these opposite forces to something like one dead level is a boon which cannot be over-rated. We are not going to say deliberately that Manders' pomade does all this, but it goes a very long way towards it.

Some of the pretty shades of carmine-red are very soft; they wash out on the stone and dampers, and generally give an undesirable tint to the paper. Here a judicious use of Manders' pomade greatly improves matters, and holds the pigment well in the varnish. One of the firms—Messrs. T. Sale & Co., Manchester—who experimented with this pomade, expressed considerable satisfaction at its action with these reds, which had hitherto given endless annoyance. At the same place it was demonstrated that a ten or twelve-colour chromo could be printed with ease and without gloss by the use of this pomade. If it had no other quality, this alone would recommend it. How many printers fail to obtain even, unspotted prints, and see work spoiled before their eyes, because in printing the first two or three colours of a chromo there has been too much varnish, or the varnish has been too stiff, and the remaining colours will not lie flat nor dry upon the glossy surface so produced. This pomade alters all this. It softens the varnish, gives the utmost ease in obtaining flat tints, and does not retard—but rather hastens—the drying; whilst colour after colour can be put on without the appearance of any hard glossy surface incapable of absorbing the varnish of the finishing colours.

Blue, of various kinds, is prepared from quick drying materials—iron and the like—which rapidly oxidise and become spotty. Umber, sienna, and lead chromes are of the same nature, but do not generally give the same amount of trouble as blue. This rapidity in

drying is overcome entirely by the use of the pomade, and the printing goes forward as evenly and smoothly as the most critical printer could desire.

Another firm—Messrs. Blacklock & Co., Manchester—who experimented with a sample of this pomade, found that the final prints at the end of 56,000 runs, from three stones, were in every respect equal in solidity and quality to the first impressions, the result being in the main due to the use of the pomade.

Bronze printing has become quite a leading fashion, though it is to many the most difficult, owing to the very variable nature of the paper used. Many labels and tickets, and even business circulars, are printed wholly in bronze, whilst the use of bronzes on cards is without end. Some of these papers have a surface like glass; others have a poor enamel, or surface; and others are so soft that the printer is always expecting to see the sheets torn to pieces by the tenacity of the bronzing ink. Now, to a large extent this is simplified, and the dread of bronze printing should have disappeared, since this soft pomade can be most effectively introduced into every bronze ink, and the difficulties overcome.

In thus describing generally the character of the pomade, no mention has been made of its mode of use. We remember a printer who was told to mix some tallow with his ink, and he mixed the tallow, but found that his trouble increased. On close examination it was found that he had mixed the ink with the tallow, or, in other words, had put in more tallow than ink. So with this pomade, the quantity used must be very small. Some inks can be prepared with pomade only, and no varnish. That is especially the case in printing from zinc. The use of it does not retard drying, and adds to the brilliance of the colours. In fact, there is no doubt that the real value of the material will bring it rapidly to the front, and we have the satisfaction of knowing that it is "Made in England."

The graphic arts spread slowly but surely the world over. We came across an instance in connection with photo-zinco etching a few days ago, which is of interest and worth recording. Less than ten years ago some Chinese printers recognised the growth and utility of photo-zinco engraving, and wrote over asking for a practical man capable of teaching the art completely to Chinese workmen. At that time the leading firm of photo-zinco engravers was Messrs. J. Leitch and Co., but negotiations were hardly satisfactory, as a suitable man could not then be found, and it resulted in the Chinese printing house deciding to send over two Chinese workmen to learn the art. They came and began with lithography at the offices of Messrs. Brand and Co., lithographers, Cloth-fair, and subsequently they learned the photo-zinco engraving art under the tuition of Messrs. Cattell and Co. (an offshoot of J. Leitch and Co., the original firm). We are reminded of this experience by the wants of a large firm of printers in South Africa, who are now seeking a suitable practical man to take sole control, as well as to establish a photo-zinco engraving department at Cape Town. Thus spread the various arts in connection with progressive printerdom.—*B. & C. P. & S.*



## The Best Paste for Fine Prints, Bookwork, etc.

**A** GOOD mountant is such an important and useful thing that no excuse is needed for devoting a special article to it. I shall try to be both clear and concise in what I have to say, for nobody ever reads a long sham-scientific-style sort of article—at least, such is my experience.

One hears a great deal about various mountants—glue, gelatine, arrowroot, and so forth—but my own experience is that nothing comes up to our old friend starch. Clean, inexpensive, not injurious to the print, easily kept, easily made, and easily applied, it is undoubtedly one of the best mountants we possess; but it must be *good* starch. I think it is because most people get the cook to make their starch for them that it has fallen into such disrepute. That estimable female never bothers her head about such a little point as crushing it up properly; it is really a matter of supreme indifference to her whether it sticks or not. Now, there is one way to make starch, and one way only. Get a cup, and put into it about a teaspoonful of starch, and mix with cold water till it is about the consistency of cream. Pound the starch very fine, leaving no lump big enough to see. Then pour on boiling water—really boiling, mind—till it forms an emulsion, and the starch is made. If it is too thick—which is not likely, by the way—add more hot water.

You must add some antiseptic to waylay the *bacterium termo*, or your starch will only keep a few days. There are many such: methylated spirit, alcohol, corrosive sublimate, carbolic acid, oil of cloves, and boracic acid are the most useful.

Oil of cloves is an excellent preservative. However, I do not care for the smell of it myself, so I have little practical experience of it. I believe a teaspoonful of the oil to four ounces of starch is sufficient.

My own favourite is boracic acid. It is cheap, fourpence an ounce, which will do for quarts of starch, not poisonous, and very efficacious.

To make starch with it, put a little into the first water you use; boil it till it dissolves, for it dissolves very slowly in cold water. Then mix up the starch thoroughly with it, and proceed as before. About a teaspoonful of the crystals will keep four ounces of starch indefinitely. —CHARLES MACLAURIN in the *Amateur Photographer*.

THE first essential of a good work of art is that it shall be true; to say that a work of art is untruthful is to say that it is opposed to some natural law, or, in other words, that it is unscientific. The highest productions of art, and the highest appreciation of these products, can only be attained by the aid of scientific knowledge. The learned man must ever be a better critic than the ignorant man. One, by the aid of knowledge, understands what he sees; the other accepts the false for the true, or rejects the true for the false, from his ignorance of the nature of things, that is, his ignorance of science.

## Photographic Recreations.

**"BIG HEAD UPON A LITTLE BODY."**—Place in front of the sitter a piece of black velvet, so as to cover the whole body up to the neck. Expose a plate on the head as large as you desire; after which, cover the head and neck of the sitter with the same velvet, and photograph the body upon a different plate, reducing in size as desired. In printing, adjust one negative upon the other, and print through both in one operation. Films are used to the best advantage.

**THE HEAD UPON A PLATE.**—As in the former operation, cover the body, and the sitter must hold a plate broken in half up to his neck without showing his hand. Afterwards make a second negative, covering the head, with sitter's hand stretched out as if holding something. Care must be exercised in registering the two films, so that the one printing operation will produce the desired result.

**SILHOUETTES** (shadow picture).—To make a perfect shadow profile, place between the sitter and lens a sheet of fine tissue paper (sepia skin) large enough for a bust picture, place a light behind the head of the model, which will throw a shadow of the sitter's profile on the paper. Upon this shadow do your focusing. Burn behind the sitter's head some magnesium ribbon during exposure, and you will have a perfect silhouette negative. —*Photo Gazette*.

## Fluorography.

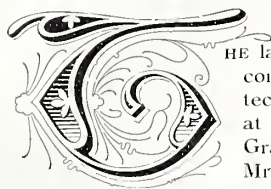
**FLUOROGRAPHY** is a process that permits, through fluorated inks, of transferring lithographic or phototypic images to glass. In contact with sulphuric acid, these inks disengage hydrofluoric acid, which engraves upon the glass delicate images that one might say were traced by snow and hoarfrost.

In order to obtain this artistic result, a phototype is inked with the following mixture:—

Glycerine .. .. .	400 grammes.
Water .. .. .	200 ..
Fluorspar .. .. .	100 ..
Tallow .. .. .	100 ..
Soap .. .. .	100 ..
Borax .. .. .	50 ..
Lampblack .. .. .	50 ..

From this, proofs are taken that are transferred to glass in the same manner as would be done for transferring them to a lithographic stone. Then the glass is bordered with wax and covered with sulphuric acid concentrated to 64° or 65° Baume. At the end of about twenty minutes the acid is poured off and the plate is washed thoroughly with water and cleansed with a solution of potash, in order to remove every trace of acid. Finally, another washing is given with water and the glass is wiped with a warm cloth. —*Le Genie Civil*.

## Technical Education in Derby.



THE last distribution of prizes in connection with the Derby technical classes took place at the Abbey-street Higher Grade school, November 25th. Mr. W. Bemrose, J.P., presided, and amongst those present

were Mr. Councillor G. Bottomley, J.P., Mr. H. M. Hobson, Mr. W. Bacon, Mr. M. Prince (hon. sec.), Mr. W. P. Edwards, Mr. Jordan, Mr. J. Line (Newport Pagnell), Mr. T. Mawbey, Mr. F. Carter, Mr. G. Wallis, and Mr. H. L. Woodford (teachers of the letterpress class), and Mr. S. D. Hall (of the lithographic class).

The chairman, who was received with applause, said, before he proceeded with the pleasant task of rewarding merit, he should like to say a few words about the classes which had been held in connection with the examination. No doubt all present were fully aware that up to the present time they had been promoted entirely by private enterprise. The City and Guilds had paid the teachers, and thus the class had been conducted in the past. In the future, the Corporation would take the place of the City and Guilds, and so the classes would be carried on without expense. He considered that the classes which they had attended in the past were really technical classes, and quite above the ordinary school classes or art classes either, because they were purely technical to the trade in which they were engaged. They were not open to the outside public, like other classes, and therefore the students were competing and working under special conditions.

Apart from the work of these particular classes, he should very much like to be permitted to say a few words upon technical education generally. Let them consider first of all the value of technical education to themselves and to all artisans. Some people deemed it to be of but little value, but he assured them that if they studied the question as he had for a number of years and its effect upon all countries, with a large technical library to make use of, they would come to the same conclusion, that instruction of a technical character was of the utmost importance to them, individually as well as nationally. Now, as to its value to working men individually. He had heard that the manner in which mechanics who had passed these examinations afterwards earned their daily bread was not so much by the sweat of their brow, as it is termed, but that their work came to them in a far more interesting form. They had got to understanding their business in a much better way. They understood the surroundings, and that fact added to the pleasure of their employment. As they all knew, knowledge was power, and the workmen who enjoyed this power were in a position above most men. He could also advance another reason why it was important that men should attend such classes of instruction. There were cases in Derby in which men had been chosen to go abroad to fill important

positions with good salaries, for, although they were but young men in years, they were old in knowledge. They had been selected simply because they had gained certificates or honours in such classes as those present had been attending. They would at once see that all this opened up a new life to a man. In a very few years, if an employer of labour had two men equal in their capabilities as ordinary workmen but one could produce a certificate of the City and Guilds, that man would be the one chosen by an intelligent master. He could follow out this vein of argument in many ways, but those present, or most of them, were connected with the press, and they were reckoned as a body of intelligent men, so that they could follow these thoughts out themselves and see how valuable they were personally. He should also like to say a word to the employers. Many employers, he was sorry to say, did not understand the question, or see the value it was to them as employers. Supposing a boy left school and was put to a business or trade. In the ordinary course of events, he went from school to the workshop with his brain stuffed full of knowledge which, perhaps, he would never be called upon to exercise. Now, if that boy went into the joiner's shop, what occurred? He went there perfectly raw; the workmen amongst whom he found himself were too busily occupied to teach him how to use the chisel or the saw, and the consequence was that he became simply a drudge in the shop, and perhaps two years or so of his life were sacrificed before he really commenced to do any work at all. Now, side by side with this case, let them take that of a boy who had undergone a manual training during his school life. That boy went into the workshop, and was perhaps told to make a drawing of a tenon. Then he was told to make the tenon itself, and when his ability was discovered he was at once put to the ordinary work. Such a youth must be of greater value to an employer, but he (the speaker) did not stop at that. Things were changed now from what they were formerly, and the youth who did this could command, and would get before long, a *quid pro quo* for life. All through life he would be a better man than those who had not such knowledge as he possessed. Then, again, what value was technical education to a town? He could best illustrate that by telling them what their neighbours were doing. He paid a visit to Leicester a few days previously, and went over the technical schools there. At Leicester they started their work at the same time that Derby did, and, although they had no fine building in the shape of an art school, they began in earnest. A large house was taken, and in that house no less than seventeen trades were being taught in the elementary stages. All these trades were such as in Derby they had not even looked at. He was told that this technical school at Leicester had already done an immense amount of good to the trade of the town, and if it did that for Leicester, it might be done for Derby. There were two golden rules in connection with manufacture and its success, which ought ever to be kept in mind. One was that the object should be pleasing to the eye and of beautiful form and colour. If they had this it formed the foundation of success.



The second rule was always to employ the best workmanship produced by technical skill and science. If they had these essentials, they would have the best and cheapest articles, and articles which would be bound to sell. In other words, *design* sells the article. He did not know whether there were any students present that night who had failed, but if there were, he would remind them that they must be better men for having gone through the examination. If they would only try again, they would find that they would get through with comparative ease, and gain much more knowledge than if they had only competed once. With regard to their teachers, he might say that they had been very fortunate. They consisted of self-made men, and from the results obtained he did not think there could be better teachers. He was told that the people at Leicester thought very highly of Mr. Hall, not only from his teaching powers, which were remarkable, but also for his untiring courtesy and gentlemanly bearing. Before proceeding with the distribution of prizes, he desired to make it known that some of the books which were to be given as prizes, had been supplied by the Printers' Society. The teachers, out of their hard-earned money, had been so kind and good natured as to assist in purchasing the prizes, and what they had given had been supplemented by the committee.

The chairman then proceeded to hand out the awards as follows:—Messrs. John H. Graves, Wm. T. Collier (who also won the Institute's bronze medal), Wm. B. Ridgard, Henry W. Ashman, Wm. S. Frazer, Ernest E. Lloyd, Samuel J. Smith, John B. Mill (who also won the Cordwainers' Company's prize of £1 and the Institute's bronze medal), John Irwin, Thomas W. Stone, William Beckwith, Alexander Durward, Harry Slack, William Stone, J. B. Jackson, John Wilson, John Parker, and Dennis A. Cole.

Mr. T. Mawbey, in the course of his remarks, pointed out the prejudices which these classes had to combat when they were first established, and also referred to the benefits which were to be obtained from attending them and competing in the examinations. He also bore testimony to the ability of the teachers, and said he felt confident the day was not very far distant when every young man who wished to qualify himself in the craft would have to hold a certificate of efficiency. As the art "preservative of all arts," theirs ought to be always in the van, and he wished the class every success in the future.

Mr. H. M. Hobson reiterated the observations of the chairman with respect to unsuccessful competitors, and said he hoped that they would try again with fresh vigour and renewed energies. Mr. Hobson then proceeded to allude to the increasing importance of technical education, and said it would tend to make men better citizens as well as better workmen. He endorsed the remarks of Mr. Mawbey with respect to the printing trade being the last which ought to sleep in the matter of technical instruction, and said there was no trade which afforded a greater scope for a high standard of general intelligence, or of technical education. Some remarks had been made about competitive examinations, but he thought it would be difficult to find a better test of true merit. He was

quite sure that a good system of technical education would enable us, in some degree at all events, to combat those great difficulties which surrounded our foreign trade.

Mr. W. Bacon next proposed a vote of thanks to the teachers, remarking that he was quite sure their duties had been of a very arduous character.

Mr. Clarke briefly seconded the motion and it was carried.

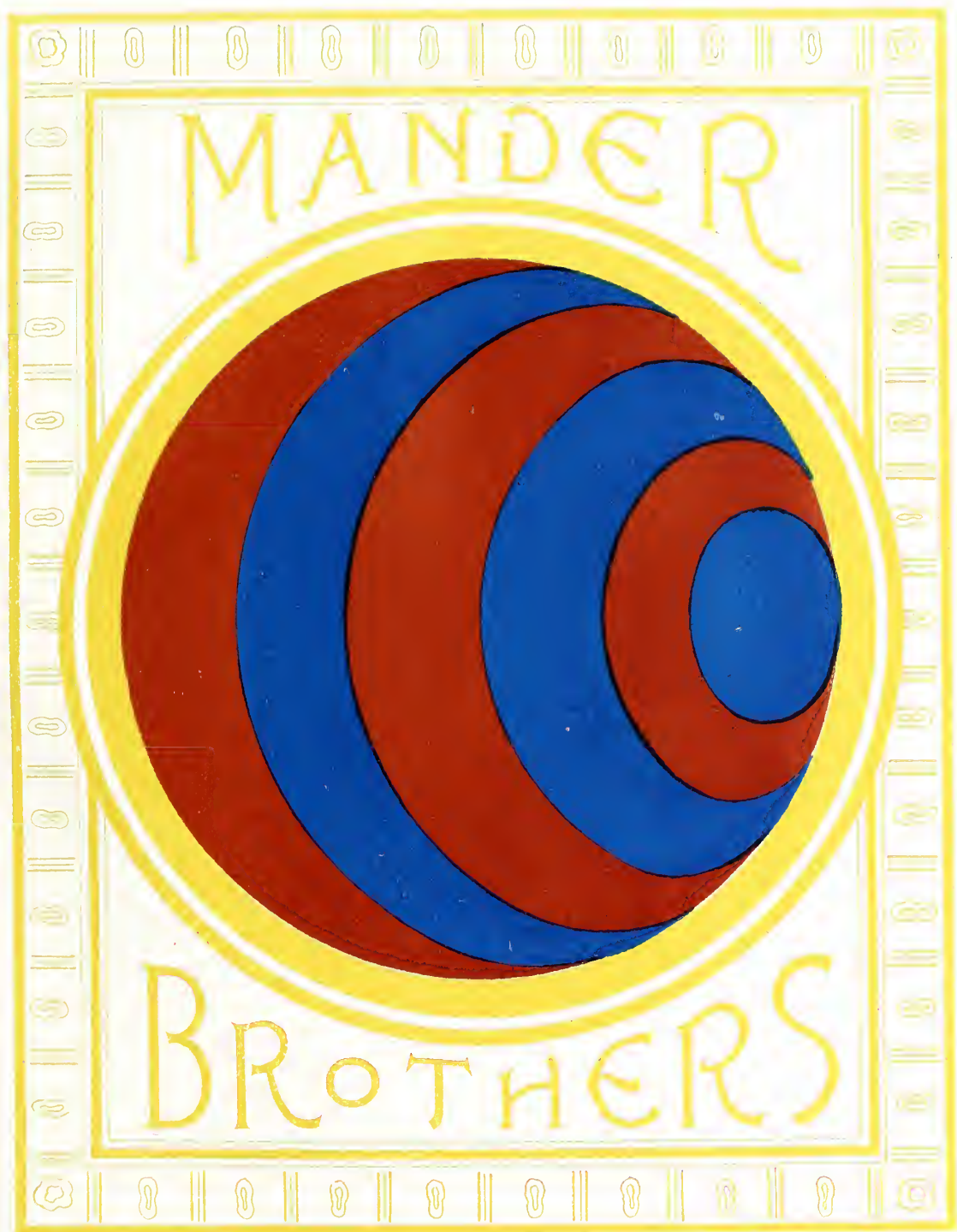
Mr. Councillor Bottomley, J.P., next rose for the purpose of moving a vote of thanks to the chairman. Speaking of the value of technical education, he mentioned that in Yorkshire the managers in the various manufactories were all certificated men, and it would be useless for a man who did not hold a certificate of efficiency to apply for a situation as manager there. Not only the ordinary apprentices, but the employers' sons worked with them in acquiring good sound technical education. It was the same in the West of England, and there, ample evidence showed that the man who studied and gave his time and attention to that branch of industry to which he had devoted himself, was the best off. With regard to the teachers, he knew that they deserved the best thanks which could be accorded to them, and the best thanks of all were due to their chairman that evening. His services to technical education had been most valuable.

Mr. M. Prince (hon. sec.) supported the motion and said he did so with additional pleasure because Mr. Wm. Benrose was the initiator of these classes in Derby. He heartily endorsed the suggestion that the new committee should add to its numbers members of the various trades connected with the classes, in order that both employers and employed might throw all their energy into the work. The only two additional classes added to the old syllabus were the lithographic and the typographic classes, but he thought there was plenty of scope for the technical instruction committee of Derby to do something beyond this. He thought that an ironworkers' class might be started, as well as classes for the instruction of joinery and masonry. They might fairly ask the technical education committee to do something from which some benefit could be derived from the money which had been placed at their disposal.

The motion was then put and carried, and the chairman having briefly replied, the proceedings terminated.

THE *Engineer*, some time ago, contained an excellent article upon "The Untrustworthiness of certain Photographs for Scientific Purposes." Taking up its text in the Americanism, "Can Photography Lie?" by several illustrations it shows very plainly how buildings in particular can be distorted so as to give them an appearance totally different to that which they take in the human eye. Whilst we have no desire to have the delinquencies of photography shown up too much, it is just as well that everyone should know that to obtain a correct representation of any one object, it is not only necessary to photograph it, but to photograph it properly. This should be borne in mind when photographing for lithographic drawings.



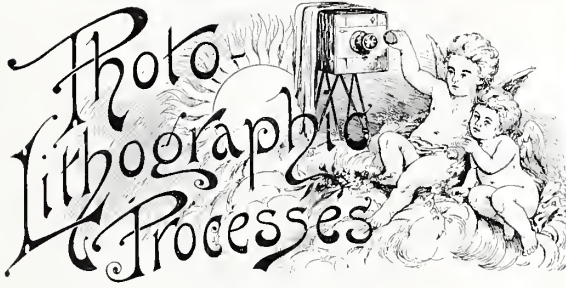


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TINT OF OLIVE BROWN, 0775, AT 4 PER LB





## CHAPTER X.

THE PREPARATION OF THE SUBSTRATUM FOR  
THE COLLOTYPE FILM.

So much depends upon the substantial nature of the colotype film, that the following descriptions will contain information drawn from every source to secure the combined experience of all the leading experimentalists on the matter. It is true that they differ in details, but the leading preparations are much the same, and whilst one experimentalist uses a certain formula successfully, he does not at all preclude the use of other formulæ which are upheld by other practitioners. It is largely a matter of experience as to which formula to adopt, and the reader is purposely provided with several methods, so that should failure attend one mode of procedure, there are others available by which success may be ultimately attained.

The first point is the nature of the support for the film. Lithographic stone is too cumbersome unless in thin slates. Copper or brass plates may be used. Zinc plates must not be used, because they tend to cause spots in the film. All these, however, have the drawback that they are not transparent, and for that reason are not so suitable as glass in the printing frame. The glass must be a good stout British plate at least  $\frac{3}{8}$ -inch thick. Such glass may be often secured at salvage sales, and is quite as good as new plate. The dimensions of the plates will entirely depend upon the probable size of the work to be produced. The general run of colotype prints does not much exceed 8×6 inches, and for that purpose plates of 12×10 inches will be ample to give a good margin to assist in proper rolling and clean prints.

The glass plates are used either polished or ground. The latter seem to be the more advisable, since the grain gives a better hold for the adhesive substratum. To grain a glass plate, it should be placed perfectly level on a firm support, not necessarily rigid, but more of the nature of leather. Upon the plate is sprinkled some very fine emery powder, such as Oakey's Wellington knife polish, and upon the emery sprinkle a little water. The layer of emery is ground upon the plate by putting another similar glass plate upon it and working it in a manner similar to the methods of grinding and graining lithographic stones by the

superposing of a second stone or smaller graining muller. By this rotary motion, both plates receive a fine grinding, and not until both plates are equally ground should it be discontinued. To secure this state, it may be necessary to add more emery and water, and finally finish the less ground patches on both plates with a smaller muller of glass plate and emery. The ground plates should not present any unevenness or scratch, and are then ready to receive the first coating. Whether the plates are ground or used polished, they must be scrupulously clean before the first coating is applied. To clean the plates after grinding with emery, they should be well rinsed under running water and the surface well brushed with a stiff bristle brush. To assist the cleaning, a solution of washing soda may be used with the brush; this will free the surface from grease. Or, after well brushing, it may be rinsed in a solution of:—

Ammonia	2-OZ.
Methylated spirits	2-OZ.
Water	5-OZ.

Or, if polished glass be used, the surface can be effectively cleaned with a weak solution of nitrous acid. After the application of either of these cleansers the plates must be most thoroughly washed with clean water. The plates should then be slightly warmed, thus expelling every particle of moisture, and preparing them for the reception of the first or adhesive layer.

Some experimentalists still adhere to the original practice of Herr Albert, and put upon the plate a solution of:—

White of eggs	169 ccm.
Potassium bichromate	8 grains.
Glycerine	10 drops.
Water	480 ccm.
Ammonia sufficient to turn the mixture bright yellow.	

The glass plate is then dried at about 100 to 110° F. (37° to 44° C) in the drying box, a description of which will be given subsequently. When dry, the glass plate is turned over, film side down, upon a black cloth, and allowed to be exposed to light for half an hour. The film thus becomes hardened and attached to the glass, and serves as a substratum for receiving the absolute film layer afterwards. However well this method may be used, it can scarcely be so good as the more modern method of putting upon the warmed plate a substratum consisting of a mixture of:—

Stale beer	10-OZ.
Ammonia	$\frac{1}{2}$ -dram.
Syrupy silicate of soda	2-OZ.

The beer is mixed with the ammonia by continually pouring to and fro from one vessel to another, and then allowing it to stand for twelve hours. To this is added the syrupy silicate. The whole is well shaken and filtered through two thicknesses of surgical lint. It is then ready to be dried in the drying box at about 120 to 140° F. (48°8' to 60° C), and when dry and cool, the plates are thoroughly washed under running water until all greasiness disappears. The plates are then placed on racks to dry, and can be kept for a considerable time, improving somewhat by keeping.

The syrupy silicate requires to be always of the same consistency, and can only be selected by careful experience. If the silicate be too strong the plates



look opalescent when dry, but if they appear powdery they should be cleaned, regrained, and recoated.

Instead of the beer, some operators use a solution containing albumen, and apparently obtain similar results. The difference lies in the fact that whereas the stale beer gives rise to the presence of acetic acid, the albumen does not. The acetic acid is an advantage, as is proved by its use in the various powerful cements used for repairing broken china, glass, etc. Those who use an albumen solution have two formulæ for its preparation. The recipe of Dr. Schnauss is:—

White of eggs .. .. .	7-oz.
Syrupy silicate of soda .. .. .	3-oz.
Distilled water .. .. .	8-oz.

whilst that published in a lecture by Messrs. P. L. Waterlow and J. D. Geddes, before the Royal Engineers at Chatham, consists of:—

White of eggs (albumen) .. .. .	10-oz.
Syrupy silicate of soda .. .. .	4-oz.
Water .. .. .	10-oz.

In both of these the well-known method of mixing is adopted by putting the whites of eggs into a bottle with a number of fragments of glass, and shaking them up until reduced to a fine frothy liquid. This liquid is carefully filtered through previously moistened cotton wool in a funnel; after which the silicate of soda is added, the water having been added before the shaking up with glass fragments in the first bottle.

In use all these substratum solutions can be poured in a little pool upon the glass, and spread out to the edges by the use of a glass rod until the layer is even.

Mr. Wilkinson has also published another substratum solution, made on the same lines as the two last described, and consisting of:—

White of egg from .. .. .	5 eggs.
Syrupy silicate of soda .. .. .	2-oz.
Water .. .. .	10-oz.

In preparing the beer and silicate solution, it should be allowed to stand at least six hours before use. If, after standing awhile, there should be a flocculent precipitate, the silicate is not good, and another preparation should be made. It is better to use the beer substratum, with its little difficulties, rather than the albumen one, since the latter demands the use of a hot water tank for soaking the plates previous to putting on the sensitive film. This operation has been proved to be the only effective means of preventing the sensitive film peeling off the glass prepared with an albumen substratum. It is noticeable that the albumen substratum is allowed to dry in the air, after the surplus has been run off, taking about two days to become ready for the reception of the sensitive film.

Old collotype glass plates can be used over and over again by removing the old films. The plates should be soaked in hot water for a few minutes, then well scraped with a broad ended knife, after which the remaining film is ground off by using emery and patent pumice stone. The film may be more rapidly removed by soaking in potash lye, but this substance is not at all pleasant to use, and can be avoided by well grinding with emery; after which the grinding must be executed as formerly described before putting on the substratum.

[To be continued.]

## Technical Classes.



### SYDNEY, N.S.W.

**N**EWs comes from Sydney, New South Wales, that a class in lithography has been commenced in the Technical School, Harris-street, under the instruction of Mr. A. Lawson, a first-class lithographer and a competent painstaking teacher. The class, together with another class in typography taught by Mr. Wm. Wannell, is entirely supported by a grant from the Colonial Government, and has a complete modern plant fitted up specially for the use of the teacher and students. The class, which runs for six months, is reported to be well attended, and the teacher devotes the whole of his time to it.

### LONDON.

We learn, from a report recently issued by the trustees of the St. Bride's Printers' Institute, that a technical class in lithography is to form a part of the educational scheme of the Institute, and that the room set apart for this will be fitted up with a complete lithographic plant. We would commend to the trustees a study of the proposed plan for similar instruction in the Drexel Institute at Philadelphia, printed elsewhere in this issue.

**AN EXCELLENT PASTE FOR GLAZED SURFACES.**—For attaching to glazed surfaces nothing is better than bichromated paste, which is used for attaching paper to glass in the manufacture of electric instruments, and which is a most useful paste for many purposes in damp climates. It is made as follows:—

Flour .. .. .	2 teaspoonsful.
Water .. .. .	4 ounce.
Bichromate of potash .. .. .	5 grains.

The flour must be rubbed to a smooth paste with the water, then placed in a saucepan over the fire and kept stirred until it boils. Add the bichromate slowly, stirring all the time; then stand to cool. The paste must be kept in the dark, and used as soon as possible. Soak the paper in it and attach to the glazed surface, then place in direct sunlight for a day; this sets up a chemical change in the bichromate, and renders the paste insoluble.—*Journal of the Photographic Society of Japan.*

**IMPROVEMENT IN PHOTO ZINCOGRAPHY.**—For transferring photo-litho copies to zinc plates Herr August Albert details, in the *Photographic Times*, the following method:—The copy is printed, developed with fatty ink, and dried as usual. The drawing is afterwards dusted in with a finely pulverised mixture of ten parts of asphaltum and one part of pure beeswax, and all superfluous asphaltum removed by means of a fine camel-hair brush and a tuft of cotton, and slightly heated over an alcohol lamp to melt the asphaltum together with the fatty ink. The copy is then passed through the saturated alum bath to keep it uniformly moist, laid between sheets of moistened blotting paper, and finally transferred upon a zinc plate.



THE GARDEN OF THE GARDEN



Printed on Grosvenor, Chater & Co. London  
DE MONTFORT & SONS 1871





Supplement to the British  
Lithographer



Suggestions  
for  
INITIALS  
for  
Illuminating



W. H. & C. 1854



## Trade Reports.

(From our Special Correspondents.)

### LEEDS.

#### YORKSHIRE DINNER.

**F**OR the seventh time since the establishment of the Lithographic Artists and Engravers' Society, the members of the craft in Yorkshire again met at Leeds, on December 10, 1892, at "Ye Greene Dragonne," to partake of an excellent dinner and pass the remainder of the evening in mutual entertainment. As set forth on the ticket and menu, the dinner commenced "at half-past five of ye clocke," after which "there was much wit, songe, and pleasure." As is customary at these Yorkshire dinners, the members do not disperse after the dinner until the "dry" proceedings are dealt with. Thus it was that Mr. J. D. Stokoe opened the evening with some well-chosen remarks, and proposed the toast of "The Queen." In quick succession Mr. J. J. Beahan, the energetic branch secretary, proposed the toast of "The Society," and in the course of his remarks dealt with the facts of the memorable Yorkshire strike of printers, so far as it affected the artists, and he struck quite a chord of harmony when he stated that the action of the executive council of the society had created the strongest feeling of confidence by their liberal view of the situation of the artists in Yorkshire, at that crisis. Mr. Charles Harrap (the general secretary) responded, and in the course of his remarks traversed the facts of the Yorkshire strike, occasionally drawing inferences that there was a want of cohesion not only between the letterpress, book-binding, and printing crafts, but with the artists also, which has but one effect—the ruin of any onward movement. He said that undoubtedly the artists had suffered along with the lithographic printers, but expressed his belief that the suffering would have been of shorter duration, had the crafts been firmly actuated by the true principles of federation. These opinions led him on to further express his belief that we must, as a body, sink personal feelings, sink petty jealousies, and present a bold and united front. He shewed, by citing instances, how often artists were deceived by glowing promises from firms who never intended to keep them, and strongly advised artists to be more communicative one with another to prevent trade abuses. He touched upon the keen internal and foreign competition, and made use of information recently obtained from an old member of the society, just returned from America, to shew what appeared to be the unscrupulousness of the majority of American firms. He also mentioned that as affairs stood at present, with the knowledge of American business, and the expressions of American journalists, "Protection" cannot be looked to as a means of improving our internal trade. On this point, he again remarked that it was not so much from foreign competition on fair lines that we suffered, as from the want of good management within our own firms. In conclusion, he expressed the wish that the Leeds branch would continue with even greater prosperity in the future.

In the unexpected and quite exceptional absence, from causes beyond their control, of the usual contingent of Bradford members, Mr. Simpson (late of Nottingham) proposed the toasts of "Our absent friends," which was responded to by Mr. A. Haigh, and drunk with the customary heartiness significant of the good feeling which has always existed between the branches in the sister boroughs. Before dispersing, a vote of thanks was heartily accorded to the chairman (Mr. Stokoe) and the vice-chairman (Mr. T. Dods). After which, "an interval of ye duration of 30 minutes told by ye clocke" followed. The party re-assembled in good time, and though lacking some of the usual hearty hilarity imparted by the Bradford members, nevertheless contributed to make a capital evening's entertainment. Mr. Stokoe gave first-rate renderings of high-class songs, and Mr. Clayton sang some well-known ballads to an appreciative assembly. The comic song element had worthy exponents in Messrs. Carr, Johnson, Bradley, and Stead, whose productions are not likely to be forgotten for some time. Mr. Carr especially took the eye and ear of all present. Besides the vocal effort, Messrs. Cunningham and Harkness tuned the ear with good violin solos. The pleasant evening came to a termination too soon, and it was left for "ye guests to returne home, be they notte beset by thieves and robbers." As may perhaps be gathered from the quotations in this notice, both the ticket and programme of the dinner were worked out in pure old style, and printed on good rough paper. It often seems to us that when artists know for what and for whom they are designing, they put a thoroughness of spirit into it, which does not always become apparent when the instructions for a design come through two or three hands and become mangled in the transit.

### DUBLIN.

**ANNUAL REUNION.**—On Saturday, November 26th, 1892, the artists and engravers of Dublin, with a few friends, held their annual reunion at the Wicklow Hotel, in that city. The proceedings consisted of a substantial *table d'hôte*, followed by a musical evening. After the dinner had been disposed of, the late branch secretary, Mr. J. B. Matthews, took the chair, and called upon those present to take part in adding to the sociability of the evening by vocal effort. The members heartily responded, and when a pleasant time had thus been spent, the chairman called upon Mr. S. McClenaghan, the new branch secretary, to propose the toast of "The Society," in response to which Mr. Charles Harrap (general secretary), from Manchester, dealt closely with the financial and numerical strength of the society, drawing comparisons, here and there, to illustrate the Dublin branch in the past and at the present time. The point upon which he elaborated was the value of federation and the necessity of closer kinship between artists and printers; calling attention to recent acts of the federation, the result of which had been to publish throughout the kingdom the causes of dispute in various centres, and give confidence to those particularly concerned in the struggle. So great had been the confidence thus created, that the differences in the cases mentioned had been settled in an amicable and



thoroughly satisfactory manner. In the course of a somewhat lengthy address he dwelt upon Continental and American competition, endeavouring to shew that employers in many instances failed to realise their true position, and did not know how to compete on a proper footing. His remarks were followed closely by the members present, and at the conclusion, the proposition of a vote of thanks was heartily responded to. Other toasts were given, and in the course of the remarks a number of points were mentioned which shewed considerable difference of opinion, and found food for a healthy discussion on the point of how to remove the stumbling blocks to a greater prosperity and establish a more brotherly feeling in the future. The reunion brought its proceedings to a close with the customary votes of thanks to the chair and vice-chair. The programme of music was highly appreciated, more especially as it represented the union of shamrock, thistle, and rose in the Irish capital. The menu was a very pretty card, with folded edge, designed by Mr. McClenaghan.

#### DERBY.

THE lithographic trade here is very slack indeed. The collotype departments are busy. The Society reports one member unemployed, and a majority of members have been making short time.

THE annual meeting of the delegates to the Derby and District Trades Council was held on Wednesday evening, January 11th, at the "Bull's Head" Inn, Derby. Mr. Councillor Jas. Wheeldon presided, Mr. William Hadley occupied the vice-chair, and a large number of delegates attended. Before the election of officers for the ensuing year was proceeded with, the chairman observed that trades unionism had made rapid progress during the past year in the town. They were to be congratulated upon the great victories won. They were represented upon two local bodies, and they were determined to be represented upon all of them.

#### HANLEY.

THE litho trade still keeps very flat in this district, and there are several men unemployed. The staple trade of the district does not improve much; a great deal of distress prevails, owing to bad trade and weather.

THE fourth annual dinner of the Hanley branch of the C.D.S.L.P. was held on Friday evening, November 25th, 1892, at the "Boro' Hotel," Hanley. Councillor J. Granville provided a good dinner, which seemed to be thoroughly enjoyed. Gen. Sec. Councillor G. D. Kelley, J.P., was the guest of the evening. After a hearty meal, Mr. W. J. Rushton, who presided, made a few opening remarks, and proposed the toast of "Our Guest," referring to the honour of J.P. which had been conferred upon the worthy general secretary, by his appointment to the magisterial bench of the city of Manchester. This was most heartily responded to with musical honours. Mr. G. D. Kelley, in reply, returned thanks for the very hearty manner in which they had drank his health. The branch secretary, Mr. E. J. Swetnam, next proposed "Success to our Society," and dwelt for a short time upon the satisfactory condition of the branch. The general secretary

responded, and congratulated the branch, referring somewhat briefly to society matters in general and the state of trade, and hoped he should long be spared to continue in the same sphere in which he had laboured for so many years. "The Local Firm," proposed by Mr. John Mawson, vice-president, responded to by Mr. Jesse Clewes. "The Absent Ones," proposed by Mr. Alfred T. Lloyd, in the unavoidable absence of Mr. George H. Wheelhouse. "Our Host and Hostess," proposed by Mr. Geo. Wright, and suitably acknowledged. "Our Queen," proposed by Mr. Geo. Borrett. The musical part of the programme was, as usual, very enjoyable indeed, and the best thanks were accorded to those who had taken part in the evening's enjoyment, especially Mr. R. Hammersley, for the manner in which he officiated as humorist and accompanist. A vote of thanks to the president and chairman brought a most enjoyable evening to a close.

The menu card is an artistic production, appropriately and neatly designed, and well printed. Front page shows panel enclosing list of officers, surrounded with border including guns and bag, and some capably drawn game. Two dogs at the foot are well worthy of their place.

#### NORWICH.


THE Norwich branch of the Amalgamated Society of Lithographic Printers, at the last meeting of 1892, held a smoking concert in their club-room at the Corn Exchange. The programme was ably rendered by the various members, and many of the songs and duets were greatly appreciated. Mr. A. Keymer acted throughout the evening as pianist in a very able manner. During the evening the president, Mr. W. Alden, presented Mrs. Seaman, the hostess, with a handsome handbag on behalf of the members, as a slight token of respect and thanks for the genial treatment they had always received since making the Corn Exchange their meeting house. Mr. Seaman suitably replied.

THE following story comes from New York. A number of empty-headed, hysterical girls, of more or less social position in that city, were in the habit of waiting outside the stage door after the *matinée* to see Kyrle Bellew leave the theatre, and sometimes to present him with flowers. The editor of a certain paper determined to cure them. He sent a man to photograph them with a "Kodak," and the next week published the portraits of the two daughters of a prominent New York banker in the act of handing Bellew bouquets, and looking very silly as they did it.

THE COLOUR COPYING COMPANY, of Broad-street House, E.C., are, says *Engineering*, introducing a process by which a limited number of copies can be taken of working drawings in colours. The company provide the colours and inks in bottles to drawing offices, etc., and will then provide copies of these drawings by a transfer process at the rate of 3d. per square foot. The process is claimed to do more than the photo-reproduction processes, in that colours can be reproduced, whilst, for a limited number of copies, it is much cheaper than lithography.

## Specimens.

[Will our friends kindly remember to send their specimens either TIGHTLY ROLLED or FLAT BETWEEN BOARDS; the cost is but a trifle more, and for review they gain in being presented as they come from the machine. If sent unprotected, specimens are usually so crushed and disfigured as to be utterly unfit for criticism or preservation.]

OME splendid specimens of copper-etchings in half-tone are contained in a handsomely got-up quarto volume of sketches by an American lady artist, Mary Cecilia Spaulding, of the charming scenery of Florida, in illustration of the well-known poem, "A Lost Winter," by Elizabeth Stuart Phelps, and just published by D. Lathrop & Co., Boston, U.S.A. A page illustration is appropriated to every verse of the poem, printed on one side only of heavy super-calendered plate paper. There are two engraved title-pages, and between them a kind of dedication to St. Augustine, with a view of San Marco and the great seal of the State of Florida. The delightful illustrations have all been etched on copper by the well-known firm of W. H. Bartholomew & Co., of New York, and are without exception the most artistic in tone and treatment and finished in execution of anything we have seen from the other side so far. Gilt edges and a neat grey cover, with emblematic design in brown and gold, complete a volume which we are proud to possess as a rare example of art work.

MESSRS. JOHNSON & GOODWIN, Rutland-street, Leicester, send a neat wall calendar, size 12 x 9-in., nicely worked in brown lake on card. The feature of the design is a female figure emblematical of art, leaning against a stand containing the date block. The drawing of the figure is somewhat "out," considerably marring the effect. Neat panels and scrolls containing lettering are effectively introduced—the result on the whole being creditable to this hard-working young firm.

MR. J. BROADLEY, Gutenberg Works, Clayton-le-Moors, Accrington, submits two chromo-lithographed business cards and a calendar for '93, all of which are tasteful in design and treatment, bright and attractive in colour, and excellent in technical execution. The calendar is on twelve sheets, in antique style, in black and red on old-style paper, and is calculated to attract considerable notice, and thus act as a good advertisement for the publisher.

HERR F. W. KÄHLEN, Hamburg, has recently got out some handsome sheets of linoleum patterns for Delmenhorst, of Berlin. The colouring and technical execution are excellent; that of the title-page, representing a broad staircase laid with linoleum, and decorated with palms and vases of flowers, is decidedly artistic in tone and treatment.

THE specimen of copper-engraved invoice heading given as a supplement in this issue of the B.L., is an excellent example of the effective style and finished workmanship put into all they do by Messrs. Campbell, Marsden & Co. We hope to shew further examples of their work by-and-bye.

MR. A. D. WALLIS, of Wanganui, New Zealand, whose excellent lithographic productions we have noticed on several previous occasions, sends another parcel of booklets and greeting cards, and a large picture of native life, entitled "The Latest Scandal," "to appreciate which," he writes, "you must know something of native ways of life and habits of thought." It is a capital picture anyway, well grouped, well drawn, and excellent in technical finish, and "has been highly appreciated here." The greeting cards, especially the native domestic scenes, are both quaint and novel. The booklets, "The Tohunga, and Incidents of Maori Life," and "Tiki's Trip to Town," the titles of which almost speak for themselves, are capitally illustrated; many of the sketches, such as "The Burial of Rewi," and the Maori chief's head on the cover of the first, and the heads of "Tiki" and "Tiki and his Mother" on the cover of the second booklet, are really artistic as well as natural in treatment. In every respect Mr. Wallis' work is of an interesting character, and has greatly improved since we first saw any of it a year ago.

MESSRS. GILBY & HERRMANN issue an artistic wall calendar for 1893, "made and printed in London," entirely with their own colours. Brass mounted, and measuring 16 x 10½-in., the design is somewhat striking, various panels being appropriately arranged so as to make both matter and colouring pleasing and decidedly effective. An attractively drawn female figure, emblematic of lithography, sits at the foot of a panel containing some two dozen specimens of their inks, a spray of blackberry being introduced with harmonious effect. A useful 1893-94 calendar occupies the lower part of the sheet. The design is very neat and tasteful, while the colours throughout are brightly and daintily printed. The firm are to be congratulated on the capital advertisement they have issued.

OF two office card calendars, both chromos, from Messrs. Greiner & Pfeiffer, Stuttgart, one is for Herr F. Thoma, a big dry goods warehouseman of Stuttgart, and the other is for their own business. The first is emblematic of the business, and has a full-length figure of "Commerce" incorporated into the design; the second embodies the royal arms of Wurtemberg (the firm being printers to the Court), the craft emblem, and a view of the works, a group of cupids with craft emblems forming a semi-border down the left-hand side. The execution of both jobs is as near perfection as possible.

THE office card calendar sent us by Mr. C. W. Kilby, Newarke-street, Leicester, is, in design, an Etruscan vase with flowers, on a gold ground, the name in a half-circle ribbon at the top, and the calendar in weekly leaflets at the foot. It is excellently worked out in black and brown tints, and with the ample white margin has a very tasteful appearance.

A BOOK PROSPECTUS from Herr Carl Fleming, Glogau, is embellished with seven dainty chromo-lithographs selected from the illustrations in the book. They are mostly children's subjects, the grouping, drawing, colouring, and general treatment being charmingly fresh and bright, and the technical execution first-class.



SOME of our German confrères are producing chromo-zinco work which in many respects rivals chromo-lithography. Amongst these, the firm of J. P. Bachem, of Cologne, are distinguishing themselves by the publication of a dainty series of greeting cards, printed from zinc plates on white enamelled cards, which are one and all little gems of art printing. Most of the designs consist of pretty and appropriately seasonable vignettes, which are worked out in colour, tints, and gold, and frequently enclosed in very neat rule and border panels in the "free Leicester style" of display, the whole giving a very pleasing and tasteful effect. Of the score of designs sent us no two are alike, and we note that they can be had with or without wording, thus allowing of their being used for any festive or holiday purpose.

MESSRS. THEO. STROEFER, Munich, again send us copies of their beautiful chromo calendar "Im Wechsel der Tage" for '93. As usual, it consists of twelve quarto cards with fancy cut edges, tied with blue ribbons. The designs are this time, if possible, even more artistic and attractive than ever, and consist of charming bits of rural and woodland scenery, with groups of pretty children, all natural in treatment, exquisite in harmony of colour and tint, and perfection in printing. Accompanying it is the "Lustiger Kalendar" for '93, also on twelve cards, but square 8vo in size, the sketchy designs of which are more or less humorous, and printed in black and red with a bit of grey or green tint thrown in for effect here and there.

THE calendar issued by the Litho Artists' Co., of Birmingham, is a tasteful design in very free style, printed in brown and grey on white enamelled surface card. The design is bold, yet neat in style, and the portrait, fancy ornament, and lettering are in excellent taste and uniformly well drawn. The Company are evidently equal to anything that comes in their way.

MANY men try advertising as the Indian chief tried sleeping on feathers; he put three carefully under the centre of his blanket, and in the morning opined that the man who advised him to experiment was a "heap fool." A few lines a few times, or even a yearly "card," never changed in matter or form, is a feeble effort in a good direction. It is too often the case that an immediate result is expected. To be sure, the man who returned from the newspaper office, where he had left an "ad." of "Dog lost," and found Fido sitting on the doorstep, was a convert to the value of advertising; but such cases are exceptional, and it is the "long run" that is best to calculate upon. —*Photographic Times*.

THE NATIONAL LITHOGRAPHIC ASSOCIATION held its fifth annual convention at the Revere House, Boston, Mass., the 14th of October. Seventy-five lithographic establishments and between \$6,000,000 and \$7,000,000 of capital were represented. An important question considered was the advisability of continuing the consolidation of lithographic interests throughout the country, according to the plan adopted in New York last year.

*The Magazine of Art* for December and January makes a speciality of portraits of Tennyson. As a frontispiece there is a photogravure from the favourite picture by M. Girardot, based on a photograph by Mayall. Altogether there are thirteen portraits, and two in caricature by J. Tenniel and L. Sambourne, from *Punch*. To those who are deeply interested in Tennyson these portraits must be considered a fitting adjunct to his works. The December magazine contains pictures from the Leicester Gallery, illustrations from sculpture at the old Salon, an illustrated review of "The Spanish Sharper," and two designs by Walter Crane, from all of which the draughtsman can gather some points of value. The January magazine contains a delightful original etching of "After the Festa," by David Law, the conception and execution of which leave little to be desired. In the course of a paper by Walter Crane he dwells upon adaptation and treatment of plants in design, and the value of radiating lines, illustrated by references to the figure, etc. This issue contains a fine wood engraving from the picture by E. J. Poynter, R.A., entitled "When the World was Young."

*The Art Journal* for December and January contains two very nice etchings. One is by C. O. Murray, from the picture of "When Daylight Dies," and forms the leading illustration of an article on the life and work of Ernest Parton. This etching is full of delightful atmospheric effect, and cannot fail to have a large number of admirers. Of the other articles in the December magazine there does not seem to be much of use to the draughtsman. There are some excellent views of Bolton Woods and Abbey, and some good blocks of furniture, as well as a few copies from French pictures, illustrating "Recent Fashions in French Art," and showing the extent our neighbours go in their realistic ideals. The original etching of "Flora," by R. W. Macbeth, A.R.A., depicts a pretty woman surrounded by a pleasing landscape, though the dogs seem a little awkward. The January *Art Journal* contains a notice of E. Burne-Jones, A.R.A., with illustrations of his work, including "The Golden Stairs." The figures in these illustrations, and the animals in the article on the life and work of Constant Troyan, may be turned to account by the designer.

THE photogravure illustrations in *The Portfolio* for December and January show to what perfection this photo-mechanical process can be carried. The copy from "The Breakfast," by Hendrik M. Sorgh, is simply magnificent, and in every respect borders closely upon all the richness of a mezzotint. Another photogravure by Dawson, from "The Glebe Farm," by J. Constable, R.A., is most picturesque, and gives the feeling of the picture equal, if not superior, to any etching. The other two photogravures are "Gany-mede," by G. F. Watts, R.A., and "Lady Cockburn and Her Children," by Sir J. Reynolds; both of which lend themselves well to the process, and produce very interesting copies of the works. The remaining plates are two etchings—one from High Holborn, and the other by L. Flameng, after the picture by F. Flameng, entitled "The Repose in Egypt." The latter is a very fine plate both as a picture and etching.



## Notes and Queries.

IN one of our replies (to "Patent"), in No. 7 of this journal, we pointed out that embossing in some form or another from litho machines is really a common practice in lithographic establishments. It is not generally performed as the main process of embossing, nor is it understood that embossing in its pure sense is done on the litho machine to supersede the embossing machine. But as a subordinate process, embossing is done quite as well, and upon the same principles, as in embossing machines. The principle of embossing is outside the realms of being patented, and the system of using a die and matrix is also beyond the same protection. How then can anyone contemplate for a moment that embossing in the litho machine can be patented? Embossing from engraved rollers is also an old practice, and it practically covers the whole field of the *modus operandi* capable in a litho machine.

MR. GRANTHAM, of Leeds, sends us the following recipe of an ink which he prepared upon advice:—

Dark-blue ink (iron blue) .. .. .	10 parts.
Chinese blue .. .. .	2 or 3 ..
Black .. .. .	3 ..
Hard tallow .. .. .	9 to 10 ..
To which, after grinding, is added—	
Mid. varnish .. .. .	18 ..

For use, this ink is thinned with thin or gloss varnish and palm oil. Our correspondent found that to reduce the proportion of tallow the ink worked spotty or mottled, and at the same time, with the full proportions, the stone was constantly getting greasy. Again, the ink makers had advised the use of the iron blue to obtain a bright blue. He further remarks that the use of lithophile, and the "doctor" published in No. 7 of this journal, rendered him considerable assistance in working this order. In offering a comment upon this procedure, at the outset we are surprised that the iron blue was recommended. We should advise the use of the excellent bright blue sold by Messrs. Winstone, of London. The preparation of blue is always attended with difficulty, since the pigment is usually prepared from fast drying substances. As a rule, a blue should be ground well into a small quantity of stiff varnish, then thinned with thin varnish. After which, according to old custom, a small quantity—not more than three to thirty parts of the ink—of tallow, or mineral candle, or raw oil, should be worked into the ink for printing. A more modern method, however, is to grind the blue from the tin into mid. varnish, and add about one quarter of the quantity used of varnish, of either of the new pomades in the market, viz., Manders' or Trochard's. An ink prepared in this simple manner works freely without becoming mottled, or greasing the stone, or without the grease liberating itself from the ink and becoming caked on the roller or slab. The quantity of tallow was much in excess of necessity, and the addition of the palm oil was quite out of place. Furthermore, the Chinese blue should have been ten parts, and the iron blue about three parts. The addition of the black again

lowered the tone, and produced the slate-coloured print, which is sent for inspection, instead of a bright telling colour.

Our correspondent asks how to prepare the "doctor" mentioned in No. 7. In reply, we can advise that by carefully melting down the chalk and adding the bitumen, a molten mass will result, to which the turpentine can be added carefully drop by drop until it is all mixed in.

With reference to the article upon spoiled work in No. 8, we can assure him that fine and heavy work are equally amenable to the treatment. The oxalic acid was used to keep the edges of the stone clean.

IN reply to "Half-Tint," of London, we have already had the same question asked by "Anxious to Learn," see p. 33 of No. 2, and p. 35 of No. 5 of this journal. The paper you use is hard, and the work is fine. The constant abrasion will mechanically wear the work off. Now, there are several points in which you might assist your work. First of all, when your work is transferred, treat it with lithophile (see p. 7, No. 7), or with the "Noir à Monter" (see p. 44, No. 8). Then in printing always use Manders' pomade (see current number) or E. Trochard's pomade emolliente (see p. 12, No. 6). If these precautions fail, write to us again with samples. We are pleased that you feel our journal "is a boon and blessing to men," for it is our earnest effort to make it practical, useful, and artistic.

MR. MANSFIELD, of Plymouth, asks us for information as to books on collotype. In reply, we can state that too much reliance must not be placed on books, for there is much that can only be learnt by practical work. There are, however, the two following publications from which a groundwork of the subject can be obtained:—"Collotype," by Dr. Julius Schnauss, translated by E. C. Middleton, and published by Iliffe and Son, 3 St. Bride-street, Ludgate-circus, London. "Photo-Engraving and Collotype," by W. T. Wilkinson, published by Hampton, Judd & Co., Adelphi, London.

MR. SINGLETON, of Cheltenham, asks where he can obtain the Creutz's gelatine mentioned on p. 38, vol. II., of this journal. Messrs. Winstone & Son, Shoe-lane, London, supply almost every photo-mechanical requisite, including the gelatine in question.

H. LAMBINET, in *Helios*, recommends the following dodge to those who are in a strange place, and are anxious to know at what hour any particular object or view will be well lighted: "Hold your watch horizontally, with the ring pointing toward the north. Then imagine a straight line running from the centre of the watch to the point you wish to photograph. That imaginary line will cut the dial precisely at the hour at which the subject will be best lighted. A small pocket compass will enable you to point the watch correctly."

A NEW art publication, entitled *The Studio*, is now before the public. It is conducted by Mr. L. Hind, late assistant-editor to *The Art Journal*.

## Trade Notes.



OUR READERS will find in this number an announcement of the firm of Messrs. F. Kuhn and Co., 65-66 Basinghall-street, E.C., who are agents for the well-known and enterprising German engineering

firm of Schmiers, Werner & Stein, builders of lithographic and collotype printing machines, bronzing machines, &c., for which they have an established reputation all over the Continent in all the chief printing centres. Much of the finest chromo-lithographic work that comes into the English market is printed on machines built by this firm, a fact that is proved by the flattering testimonials from the houses using them contained in Messrs. Schmiers, Werner and Stein's new illustrated catalogue. Besides the ordinary litho machines, they make a combined litho and collotype machine, which should be very useful for small offices where there is not enough of either class of work to keep a machine going. Messrs. Schmiers, Werner & Stein are the original inventors and makers of collotype machines, and have supplied them to all the most noted collotype printing firms all over the world, amongst those in the United Kingdom being Waterlow & Sons, Ltd., Martin Billing, Son and Co., the Direct Photo-Engraving Co., Ltd., the London Stereoscopic Co., the Oxford University Press, the Photophane Co., and others, all of whom express themselves thoroughly satisfied with their performance. The firm have had twenty-five years' experience of building litho and collotype machines, and have introduced from time to time numerous improvements that have, in conjunction with the excellence and finish of their workmanship, kept their machines in the very first rank for reliability and perfection of impression. A new improvement has recently been added to these machines in the shape of a brake, to be worked by the attendant at the one side, while on the other side is a self-acting brake which regulates the pressure of the cylinder as required. Messrs. Schmiers, Werner & Stein also build machines for printing in colours on tin. In this machine the printing is done with two cylinders of equal diameter. One cylinder, covered with a coating of caoutchouc, takes the colour from the stone and transfers it to the sheet of tin, which is carried between the two by the other cylinder, so that the tin never comes into contact with the design on the stone itself. We understand that no other maker supplies these double-cylindere machines, which are rapidly supplanting everything hitherto used for printing on metal. The accuracy of register is such that any number of colours can be printed. The bronzing machines made by this firm are of two kinds—the ordinary one for sheet work, and a small size specially designed for card work, so arranged that the cards are always kept flat, which cannot be done with cylinder bronzers. Those who are contemplating the purchase of new machinery—for collotype work especially—should write to Messrs. Kuhn & Co. for catalogues and prices.

FRANK HORSELL & CO., LTD., Leeds, have recently introduced four specialities for printers. Of these, the "Tint Preventer" for lithographers, and "Inkeaser" for both letterpress and lithographic printers, we have thoroughly tested. Most printers of any experience will be able to remember any number of new so-called labour-savers in connection with ink manipulation being from time to time introduced to their notice, having a run for a few months, and then being quietly dropped. The reason is not far to seek: as a rule they do not meet all conditions of working and fail to act properly when they are most wanted. We know, because we have tried most of them, and only occasionally found one that was thoroughly satisfactory all round. We must confess when we came to Messrs. Horsell's specialities the same old feeling came upon us, but as usual we determined, whatever came of it, they should be thoroughly tested. A suitable "cranky" job turning up at the right time the "Tint Preventer" was applied, with some misgivings as to the effect it might have on the work, the "minder" watching the stone as closely as a cat watches a mouse. After an hour's run his face perceptibly shortened, and in another hour or two he had come to the conclusion that it was "just what is wanted to keep the work clean." Subsequent use on other work confirms the first opinion of its merits, and we can thoroughly endorse the maker's claims for it. There was less caution required in testing "Inkeaser." Mediums for making old or new inks work easily and satisfactorily are plentiful on the market. We have tried all of them, and don't find much difference in their action, and have no doubt the composition is in nearly all cases the same, however different they may smell. "Inkeaser" is as good as the best of those we have tried so far, and acts fully up to all that is claimed for it by the manufacturers, besides having somewhat the advantage in quantity for price over some others on the market. Of "White Driers" and "White Lake," the latter a transparent reducer for delicate colours, we cannot say anything now, not having yet tested them.

### SMALL ADVERTISEMENTS.

#### Situations Wanted—Three Lines for a Shilling.

For re-postage of replies received at Publishing Offices, Six Stamps extra must be sent.

#### SITUATION VACANT.

WANTED—A Litho Printer of good character and an able workman to proceed to a leading town in South Africa, on a three years' engagement; wages £2 15s. to £3 per week, according to qualification. Free passage out.—Apply by letter, with full particulars, to "SOUTH AFRICA," Messrs. Deacons, Leadenhall-street, E.C.

#### SITUATIONS WANTED.

STATIONERY, PRINTING AND PAPER BAG TRADES.—MANAGER.—A thoroughly practical man is open to an offer as manager or other responsible position, from firms requiring the services of a first-class man who understands his business. Has spent a number of years in a similar capacity in some of the best houses, in one of which he is at present. Unexceptionable references.—Replies to "X.Y.Z." office of this journal.

TO LITHOGRAPHERS.—Young Man seeks situation as Machineminder; well up in all classes of colour work.—"LITHO," B.L. office, Leicester.





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APRIL—MAY, 1893.

PRICE EIGHTPENCE.

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## The Circulation of the B.L.

WE are pleased to say, is still steadily growing, and we learn that the recent chromo supplements are giving great satisfaction. In the present number we give some good things, which we hope will be useful to our readers, and others, including a chromo printed from the Hull Co.'s zinc plates and a specimen of work executed entirely with Day's Shading Mediums, are in a forward state of preparation.

## The "Plant Form" Competition

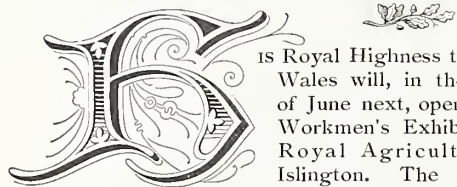
HAS turned out anything but a success. Of the drawings sent in only two were anywhere near as good as those we have already presented, consequently no prize has been awarded. We have decided for the present to drop these supplements, and in the meantime shall endeavour to make arrangements for a series in natural colours, so drawn as to be of use as studies for artists. Due notice will be given of their appearance.

## The B.L. Question Papers

HAVE not been taken up with any spirit in reply to the announcement in our last issue. Some have complained that the questions set are too stiff to be answered shortly, and others that they are too elementary. To this, we say that they were set to give everyone an opportunity of trying what they could do, and, to give all another chance, we have decided to keep the competition open till the 1st of May on the same conditions, and trust to have a better response.



## National Workmen's Exhibition of British Skilled Industries.



His Royal Highness the Prince of Wales will, in the last week of June next, open a National Workmen's Exhibition at the Royal Agricultural Hall, Islington. The scheme has been promoted by the London

Trades Council, and the secretary of that body, which represents 80,000 organised workers, has been the prime mover in the matter. Mr. George Shipton, the gentleman referred to, has been long and favourably known in connection with labour questions, and his hope is that such an exhibition will demonstrate the best productive capacity of British workmen, stimulate an honest zeal and pride in their minds for their crafts, and create a healthy public opinion against sweating and in favour of home-made industries. The Prince of Wales has evinced deep interest in the forthcoming exhibition, and has not only consented to formally open it, but to further in every way its most laudable purpose. The exhibits will include specimens of articles from the thousand and one various industries carried on in Great Britain from mine, anvil, loom and workshop, each intended to show the deftness and skill of hand of him or her who has wrought thereon, for the term "workmen" in this instance also includes "workwomen." It is contemplated that the opening will be on or about June 24th, and that the exhibition will continue for five weeks. The resolution of the London Trades delegates was to invite the co-operation of all persons, to constitute a general committee that would make the exhibition a thorough success "in manifesting to the public the great advantages of excellence in production in all industries, instead of the manufacture of shoddy and slop work, as a fraud on the public and injurious to the best interests of labour."

In the course of a conversation, Mr. Shipton said: "I will tell you freely why it has occurred to us to have this exhibition. Working men, by duty as well as necessity, are to-day compelled to face the facts of life; and we must, if possible, prevent any deterioration of those industries which are the basis of our national prosperity. We cannot, with safety to ourselves, allow the standard of excellence to be lowered, for that would lead to our ultimately becoming of less value to our employers. We find, as practical workmen, that we are driven to scamp our jobs for the most part, to the injury of our reputation, and to the hurt of men's natural love for their particular crafts. The low spirit of gross commercialism prevailing has gradually spread into every industry, and the fever for rapidly growing rich has dominated every occupation, until we find that all trades are now suffering. Workers are hurried through their jobs, and have to finish them without thoroughness, so that men are often ashamed of their work when

it is completed. Both the price paid and the time allowed in which to do the work make it impossible for the man or woman to put their full and fair skill into the task, as it were, stamping by their intelligence their individual character on the products of their hands and brains. My contention is that, whatever a man sets his hands to, the man's stamp is always to be found on the face of his work; and be he painter, metal, wood, or other craftsman, there you may read the measure of his disposition as well as his proficiency in his trade. Workers, as a rule, have, believe me, an innate love for doing good work, and are proud when they have achieved any special degree of excellence in their particular craft. This proper passion creates in them a feeling of self-respect and, among fellow-workers, ensures for the able and skilful journeyman the genuine admiration and esteem of his mates. This, I can assure you, is a very common feature among all trades in all workshops and work places. Of course the expert worker is but stimulated to better effort in his calling by this regard of his comrades, and in turn strives to maintain his handicraft at its highest excellence. Indeed, even without that fillip to his capacity, a worker who likes his trade delights in his labour and the deftness of his handiwork. As we find that the truer and higher aims of producing 'the best work' in our national industries are being rapidly destroyed, it has occurred to us, that by calling attention to this decadence we may arrest the evil, and revive the reputation for which Great Britain has been so long and deservedly renowned, of turning out products that beat the world for worth and excellence. In the language of the Lord Mayor, who has promised us his heartiest support, as we have his undivided sympathy: 'It was sad to see how in late years the public had been driven to introduce foreign work which their own people could have done equally well. Anything which would bring back to English work its old characteristic of thoroughness, and revive the class of work for which in former days they were celebrated, would be a godsend to the people of England.'

Mr. Shipton, resuming, said: "We shall not make this a novelty exhibition, although there will be a department for workmen's inventions. Our intention is to gather there the very best specimens of the skilful prowess of the workers, which will maintain the old prestige and pre-eminence of the British workman throughout the world, as against all comers, in the production of all that relates to the beauty and usefulness of whatever is necessary to human life and its enjoyment. We shall exclude, as far as practicable, such articles as are merely toy-like, and display what might be called the more serious work of skilled craftsmen. To ensure success, we have asked for assistance from representative citizens and such powerful bodies outside of the trades as the corporate authorities, city companies, guilds, and chambers of commerce. Happily, the responses have been most gratifying. We anticipate substantial assistance for the formation of a list of prizes, so as to add another inducement to the best workmen to undergo the trouble and expense of sending in articles for exhibition. These productions of their skill and patience,



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it is believed, will show what good workmanship put upon good materials is, compared with shoddy and scamped articles. We shall have a few of the latter bought at so-called 'good houses,' and outwardly looking well enough, cut asunder, dissected in fact, so that the public may see at a glance the 'gimcrack' from the genuine, honest-made article, which alike does credit to the craftsman and justice to the customer. By such means the public will be enabled to compare the articles in their possession with the exhibits, and, if they care to, make pertinent inquiries of tradesmen and others why the goods they possessed were not as well made as they ought to have been.

"There is yet another side to this question of honest work. When the workers are driven under the sweating system, or by low pay are prevented from living in accordance with a decent standard of civilisation, their productions as well as their life are just to that extent brutalised. We shall, so far as we can, push home that lesson by showing the actual processes of production under the abominable sweating conditions that prevail in many places side by side with the resultants of freer and more fairly remunerated labour. Some of the more notorious samples of the East-end sweating methods will also be illustrated, for the instruction of those who have little or no idea of how that other half of London lives. Perhaps it may then be suggested to customers that there is a morality required in buying as well as in selling goods. In order to secure a wide range of exhibits and make the exhibition as valuable as possible, we have already grouped the various industries. By that means experts, so to speak, in each branch of industry throughout the country, for the scheme is a national one, will induce competitors to send in their productions. Only articles deemed suitable and best will be chosen, and in due course will be properly arranged and classified in the exhibition building. Every trades council in the United Kingdom has already been communicated with in that connection, and in some places committees of selection have begun operations, so you see the matter has been warmly taken up by our fellow-workers. I ought, perhaps, to say that in many industries there are employers who most honourably strive to maintain excellence in their respective trades. It is part of our aim to invite the co-operation of all such employers. They can assist us and the workmen by granting the men or women materials and workshop space, and time, too, if they will, for making the articles intended for exhibition. They can help us also in other ways, but in such industries as coach-building, where the productions are costly, and include the labour and skill of several distinct classes of handicraftsmen, we look with confidence to employers to help us to show what British workmen can do in that direction. It may interest the public to know that not a few employers have kindly volunteered all the assistance in their power—just in those very industries where the products involve the labour of many hands, and the materials are costly as well as bulky. Diplomas or certificates of some kind will be given to houses that show the best work, but the prizes and medals are all for the workmen. By having invited the help of persons in high social position, and most

happily having obtained the support of his Royal Highness the Prince of Wales, we believe that not only will the exhibition attract attention everywhere, but that the best work that can be made will be shown there, and it will improve the position of our industrial population by instructing the public that, given fair opportunity, the British workman is still the best of craftsmen. Let me add that this is not to be an exhibition of amateur labour, but of the actual productions of *bonâ fide* skilled working men and women."

THE printing craft will have ample opportunity of showing the progress that has been made in the past decade. Competitions are being arranged for designs for the diplomas to be given to exhibitors, and for other subjects, particulars of which will be made known through the local committees everywhere, and for which a prize fund is being raised.

In connection with this part of the subject, our readers will we know be interested to learn that the contract for the printing required for the exhibition, including the catalogue, has been placed in the hands of Raithby, Lawrence & Co., Limited, "solely on account of the high excellence of your productions and the valuable work you have done in elevating the standard of printing throughout the country." This is to us a most gratifying recognition of our endeavours to uphold the credit of our craft, and coming from such a source we value it accordingly. The Company have also arranged to fit up and run a printing office in the hall during the exhibition, and a daily programme of the proceedings and entertainments will be printed and published.

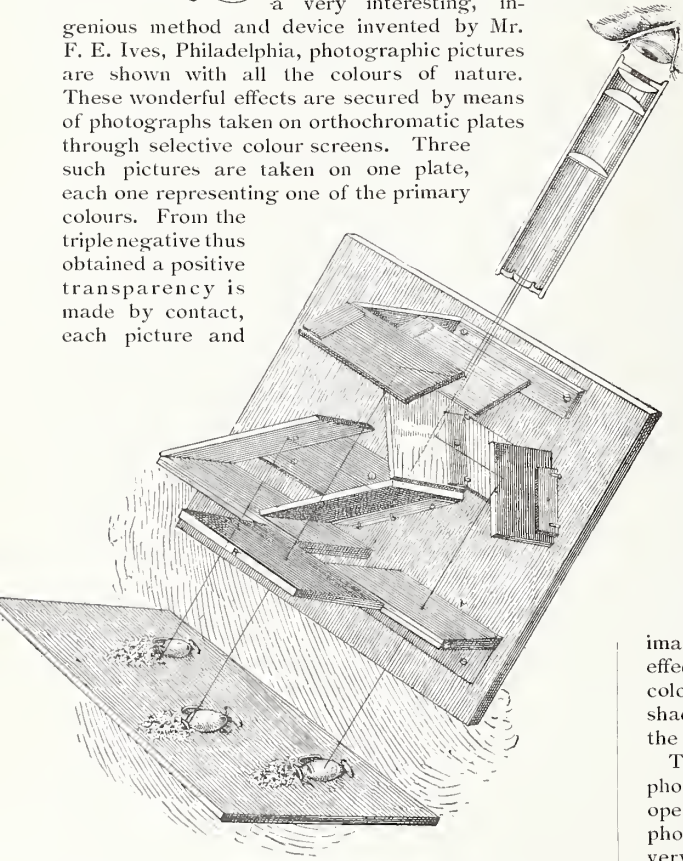
In our next issue we shall be able to give full particulars relating to the printing class. A preliminary announcement of the exhibition appears on another page in this issue.

At a meeting of the delegates of the London Trades Council at the Mansion House, on March 6th, committees were appointed in each group, with power to add to their number, and group secretaries were also elected to act *pro tem.* (as conveners) for the National Workmen's Exhibition. In group 3 (printing and allied trades) the secretary is Mr. Vandy, 13 Osborne Grove, Upper TOLLINGTON Park, N. The committee consist of Messrs. Arnold, Bateman, Young, Artlett, Hinds, Mortished, Foster, Irvine, and Withy (compositors); Messrs. W. Watts, Hurren, and Smith (litho printers); Mr. H. R. Taylor (litho artist); Mr. Irvine (typesetter); Mr. Croft (machine minder); Messrs. Woodcock, Rawlinson, T. Goddard, and R. A. Goddard (bookbinders); Mr. A. Palace (stone and zinc preparer); Mr. Robinson (book-edge gilder); Mr. T. Sims (vellum binder); and Mr. J. C. Barrett (printers' joiner). They have already commenced their preliminary work, and anticipate making a good show at the exhibition, when the Prince of Wales opens it on July 1st.

WITH April, 1893, *The English Illustrated Magazine* appears under new auspices, and the improved departures promised should largely increase the attraction of this popular monthly—one of the earliest sixpenny illustrated magazines produced in England.

## The Heliocroscope.

**A**LTHOUGH photography in colours is not yet an accomplished fact, and although none of the experiments encourage the hope of its early accomplishment, yet by a very interesting, ingenious method and device invented by Mr. F. E. Ives, Philadelphia, photographic pictures are shown with all the colours of nature. These wonderful effects are secured by means of photographs taken on orthochromatic plates through selective colour screens. Three such pictures are taken on one plate, each one representing one of the primary colours. From the triple negative thus obtained a positive transparency is made by contact, each picture and



its several portions having the true colour values. The partial images are identical as regard point of view and size, each one, however, being transparent or semi-transparent only in these portions which represent the fundamental colour belonging to the partial image. According to the modern theory of colour vision, red, green, and violet are considered the primary colours; consequently, the three pictures represent these three colours, and when viewed through an instrument provided with red, green, and violet-coloured screens, and furnished with means for blending the three images into one, all the colours of the subject are shown. The simple instrument by which these pictures are superimposed is shown in section in the figure. In the lower part is seen the triple transparency, or "chromogram," as the inventor calls it. Above the three images are arranged three coloured screens marked R, G, and V. The image below R is transparent to red, but opaque

to other colours, except in so far as it enters into combination with the other colours to produce intermediate tints. The same is true of the image below the coloured screen G, this photographic image being transparent to green and to other colours only, as green combines with other colours to produce intermediate shades. The same also applies to the picture

under the violet screen, it being transparent to violet and opaque to the other colours. After passing the coloured screens the images are superimposed by a series of transparent and opaque mirrors. By following the line of the light beam passing through the red colour screen, it will be seen to impinge on an opaque mirror near the top of the instrument, whence it is reflected to the upper surface of a transparent mirror, thence upward to the eyepiece. The light passing through the green screen is received on an opaque mirror and reflected to another opaque mirror at the centre of the apparatus, from which it is reflected through the two transparent mirrors above it to the eyepiece. The light beam passing through the violet screen is reflected by an opaque mirror to the transparent mirror at the centre of the instrument, thence upward through the transparent mirror to the eyepiece. Thus, by means of opaque and transparent mirrors the three coloured images are superimposed, and by means of the transparent and semi-transparent portions of the picture, the amount of light from each portion of the image requisite for producing the colours and their gradations is thus made to pass through the screens, mirrors, and eyepiece to the eye. A reflector is placed underneath each photographic image, so that each receives its quota of light. The effect produced is wonderfully beautiful, giving every colour and every possible gradation of light and shade as faithfully as the object itself would do under the most favourable circumstances.

The inventor states that the chromogram is a photograph made in a special camera, with no more operations than are required to make an ordinary photograph, so that we are led to believe that before very long amateurs having the special camera and the instrument through which to view the pictures will be able to show pictures in natural colours as readily as they can now show stereoscopic views. Mr. Ives, by means of different apparatus, has projected photographs in colours on the screen, where they could be viewed by a large number of spectators. It is an interesting fact that a triple negative placed in the instrument in place of the positive shows colours complementary to those belonging to the object.—*Scientific American*.

THERE is no more potent antidote to low sensuality than the adoration of the Beautiful. All the higher arts of design are essentially chaste, without respect to the object. They purify the thoughts as tragedy purifies the passions.—SCHLEGEL.

THE value of statuary is owing to its difficulty. You would not value the finest head cut upon a carrot.—DR. JOHNSON.



EVERY DAY  
Specimens  
from the  
DE MONTFORT  
PRESS  
LITHO.









BY CHARLES HARRAP.

## CHAPTER VI.

## PRINTING INKS.

**T**HE printing inks of commerce are fairly well understood by every lithographer who has been in any printing firm of moderate working capacity. Some years ago the making of printing inks was far better

known than it is now, because there was a time when all inks were prepared by the printers from the dry colours; when printers were accustomed to grind with a hand-muller every particle of ink used. Time has considerably changed this state of affairs. The great want of confidence in ink makers has been dispelled, because the very firms who formerly supplied printers with their dry pigments, now supply the same pigments to ink makers, who make them up in a very superior way, far in advance of the old system. The existence at present of over fifty ink manufacturers, has had a tendency to increase the number of lithographic printing firms; for now, it matters not how complex the colouring of any design may be, the printer simply needs to ask the ink manufacturer to match the shades, and it is done. Ink manufacturers have passed through a troublesome time. They have made inks of any and every conceivable colouring matter that has been produced, and have had an experience which cannot be altogether pleasurable. Printers and ink makers have alike been in a quandary, for in many instances neither the one nor the other knew the nature of the materials he was using. "Out of evil cometh good," and so has it been in ink making. Nowadays, ink makers are seeking education, printers are seeking education, and colourists are asking for greater variety, the result being the production of better inks than ever this country has seen in the past. Add to this, that when ink makers find that the conditions of climate are against making certain inks in this country, they wisely import those inks from the Continent, and place in the market a range of inks almost equal to those used on the Continent, available by all who are prepared to pay the price for a good article. These advantages, however, carry with them

certain extra costs, and in large establishments it is still the practice to have ink mills and grind the bulk of the inks as required.

Leaving for a moment these generalisations, and turning to black ink, a consideration of it in detail will lay the groundwork for the preparation of almost any other ink. The manufacture of black printing ink consists of three distinct operations:—

1. Preparation of the black.
2. Preparation of the varnish.
3. The incorporation of the black in the varnish.

As a general custom, it might be taken that any carbonised black renders itself amenable to ink making. The requisites of black, however, must be:—

- (a) That it will grind up into an exceedingly fine powder.
- (b) That it is not gritty.
- (c) That it does not contain any chemical which will act upon the varnish, or upon the stone or type.
- (d) That it is not heavy, and can be easily held in suspension by any medium such as varnish.
- (e) That it will remain a permanent black.

Such conditions are far reaching, and limit the number of materials at the disposal of the maker. Common gas black is available for inks. The products of the combustion of tar, naphtha, resin and other hydrocarbons, balsams, and tar products, are capable of extensive use owing to their richness in carbon. Frankfort black, obtained by the burning of vineyard refuse, as well as the animal black (known as Paris black) from burning ivory and other fine animal waste, are both adaptable to ink making. But the black mostly used is lampblack, in one form or another. Lampblack is the combustion product of the oil in a lamp, and carrying the principle through, a similar black results from the combustion of any animal or vegetable oil or fat, whether in a lamp or not. Thus it is that masses of fatty substances are decomposed by heat into gases and a residue. The gas thus formed is ignited, and a current of air carries the combustion products (black) into another chamber, where they are deposited. In laying down the conditions for a good black, the one marked (a) is very important, and in this process of making black the heavy particles which are first deposited are discarded, and only the fine, light flakes are selected, thus insuring that it will grind freely and not be gritty. The black, however, in this stage is not by any means pure. Its chemical character is antagonistic to a good combination. There is still a quantity of fat or tar and pyroligneous acid in it which must be burnt out. All blacks produced by carbonising are the same. They must be put into reverberators and calcined until the black consists of carbon only. The difference in the fineness and blackness of these calcined carbons, makes the difference in the qualities and prices of the black.

For ordinary black work, maps, writings, commercial, and music, the black can be prepared by grinding well-calcined lampblack into varnish, and adding a small quantity of a good hard blue. To obtain a finer ink, fit for chalk work, the lampblack must be replaced by the very fine Paris or ivory black. Black prepared for the best inks is made on a small scale from special oil-burning lamps.

As it is intended to devote a special chapter to varnish, the present one will be concluded with three

recipes, which will make it possible for any printer to prepare his own black. The first is a common black printing, and consists of:—

Thin varnish .. .. .	13-oz.
Stiff varnish .. .. .	3-oz.
Lampblack (calcined) .. .. .	16-oz.

The second is a good machine black, better perhaps than is generally used, but owing to its quality is cheaper in its results. It consists of:—

Medium varnish .. .. .	30-oz.
Lampblack (calcined) .. .. .	17½-oz.
Chinese or Prussian blue .. .. .	2½-oz.

This is usually used for proving, and can be relied upon. The third is, however, an expensive ink, and is mainly used for the best black and chalk work only. Its composition is:—

Medium varnish .. .. .	7½-oz.
Thin varnish .. .. .	7½-oz.
Best Paris black .. .. .	12½-oz.
Chinese blue .. .. .	2-oz.

In the preparation of any of these inks, it should be borne in mind that the method of hand grinding with a muller is effectual, but to obtain the best results a grinding mill must be employed. To get a fine ink, grinding has to be repeated; and whilst manual labour gets exhausted, machinery can do the work over and over again more perfectly and in far less time.

## CHAPTER VII.

### VARNISH, AND OTHER MEDIA FOR PRINTING INKS.

In chapter VI. the making of black printing ink was divided into three operations, one of which was fully dealt with, leaving the second for the present chapter.

The medium in which an ink is prepared is all important, for as with the black, so with the medium, it must be free from injurious substances, and play the part of a neutral, hard-drying vehicle only.

Taking a general survey of the processes of putting pigments upon paper, there is revealed considerable divergencies in the medium employed, and the question naturally arises as to why the same principle cannot be applied in all instances. In water-colour drawings the pigments are simply rubbed down into water, so that the fine particles of colouring matter are held in suspension and finally deposited on the paper. From the washes the water dries out and leaves the pigment alone on the paper. It has been shewn by most elaborate experiments that water-colour pigments scarcely fade at all, and it is sufficiently proved that water-colour pigments must be the purest and most permanent manufactured. Of course the character of water-colour work varies from oil painting and printing in the difference of brilliance and body, which are obtained by the greater carrying power of the vehicle used. Therefore, for heavy colouring a strong medium such as oil must be employed. But were it not for the bad drying qualities of many such pigments, and the want of permanence displayed by them, there seems no reason why a pure oil, not reduced to a varnish, could not be used. The fact asserts itself that much commoner and poorer pigments can be made up into oil colours than into water colours, and the defects covered by the use of varnish. On this point, experiments are not wanting to prove that

oil alone is very successful, and recent preparations of other media go far to support the same idea. In a large and successful printing firm in Yorkshire, for some years past, the commonest of pigments have been used as printing inks, and have been ground in an oil very little reduced from its raw state, or have been ground into a very common medium—partaking somewhat of the nature of varnish—of a greasy nature not much unlike vaseline. What this medium is, it is not intended to state precisely, in the absence of actual information, but it is left to surmise. This surmise is based upon well authenticated facts, which shew that the residuum left after the distillation and filtration of crude petroleum is a greasy substance with a high specific gravity, having all the properties of varnish combined with a cheapness altogether rivalling any varnish yet made.

The petroleum from California, Ohio, and Kentucky contains some sulphides in solution which are specially useful for the making of printing inks. The residuum obtained is not directly applicable, but by the addition of some resins, or resinous gums, the final adjuncts are given to it. The amount of such resins should vary according to the consistency of the residuum obtained; and as a general rule, the amount of resin to be added for a news ink should be about twenty-five per cent.; for book or letterpress job work, about forty per cent.; and for lithography, the resin should be equal in quantity to the residuum.

This residuum varnish lends itself to the ready assimilation of any pigment, and is used just as varnish in making inks. The colour of the residuum before filtering has a drawback, for on the addition of resin a beautiful olive is produced. Therefore it requires thoroughly clarifying by filtration and, if possible, bleaching. The inks thus made dry readily; they are cheaper, and vary only in consistency from inks prepared in varnish.

The point to be aimed at in printing is not the lustrous reflecting surfaces, which some years ago were considered the acme of printing, but a fine full-bodied colour, drying with a crumbly dullness on the sheet, resembling a water-colour wash, and possessing the all important property of allowing other coloured pigments to be printed on its surface without becoming mottled or giving a glossy appearance to the finished print. How far such a result is obtainable can be gathered from the character of many excellent prints which are exact facsimiles of water-colour drawings, and come over frequently from America. Some are produced in England, but they are not by any means so numerous as the American products. Such effects are not produced by the use of varnish, and varnish alone. If varnish be used, then it is tempered with some other medium. It has been shewn by published prints that the effect can be obtained by the use of oil, or by the residuum varnish, and it seems highly probable that either or both are used by the American printers. These innovations have broken the ice to a more common-sense consideration of the ways and means at the disposal of printers. Every printer knows his own difficulties with varnish, and every printer is familiar with a variety of ways in which he has to soften the varnish—on one occasion with raw oil,



with vaseline, with tallow, with petroleum or mineral candle; and on another occasion has to temper it carefully with driers, or add some one of the many volatile oils to get softness and drying quality combined. These difficulties have not been lost sight of by manufacturers, and during recent years various substances have been put upon the market to meet the matters under consideration. One of the best was Fleming's solidified oil, which although it was and is mostly used by letterpress printers, yet would be equally applicable to lithography if it were not quite so greasy. Its greasiness brings it into the same category as vaseline, and also makes it suitable for greasing machinery. Such a quality, however, must carry with it a non-drying property which has to be counter-balanced when used in printing. The particular feature of this and subsequent solidified oils, is to soften the stiff varnish, without destroying the ultimate tenacity of the varnish, nor its capacity as a vehicle.

The manufacture of a pomade by E. Trochard, of Chartres, France, known as pommade emolliente, is a very great advance upon Fleming's solidified oil. It has the particular powers of softening stiff inks, assisting in even running, producing fine flat printings, and, above all, hastens drying. It is not greasy enough to stain the stone, and cannot be used as a lubricator. Exactly the same qualities belong to a similar pomade manufactured by the large varnish makers of Wolverhampton, and known as Manders' pomade. These two pomades are soft, greasy semi-solids, and can be used in any inks. In bronzing on had papers they are exceptionally useful, and whilst they assist in holding bad drying pigments together, they also disintegrate the hard pigments, and give an evenness of printing hitherto almost unknown in printing. The latter firm have, however, previously made a substance known as glissol, the properties of which do not appear to have been as highly appreciated as they deserve. It is a liquid, having the thinness of turpentine, which can be introduced into a hard ink, or sprinkled on the slab or rollers when working with a quick-drying colour, and its effect is at once apparent in the smoothness of running which immediately follows.

The foregoing details clearly show that varnish no longer holds the paramount position it did, especially when work has been most successfully printed from zinc-plate substitutes with ink compounded with a pomade or solidified oil only.

[To be continued.]

At a recent meeting of the lithographers of the United States it was reported that there is at present only work for about one-half of the steam lithographic presses now in use, and in looking for an explanation of this falling off of work, it was found that the type printers were doing much of the work which was formerly controlled entirely by them.

MESSRS. NEWSUM, WOOD, DYSON & Co. have recently been favoured with an order from H.M. Ordnance Survey Office, Southampton, for one of their Anglo-American lithographic machines, fitted with flyers and patent self-damper.

## Pictorial Photography.



PHOTOGRAPHY has, perhaps, only recently reached a position which can claim to contain the spirit of art in its productions. The very nature of the process limits its power in that direction.

Photography at its best cannot be more than a means of copying from that which exists. Many so-called artists are but copyists; yet whether their productions are in "oil" or "water," or upon the subtle lithographic stone, there are elements of individuality and schemes of treatment which cannot by any means be introduced into the photographer's pictures; much less can the photographer hope to work up designs or produce the ideal subjects of the masters in art. No! the scope of photography is limited, and it is only in the character of the print that it can hope to bring its products into the rank of art productions.

The hard, highly glazed photographs are gems in themselves. After these come the various methods of printing in soft dull tones on "bromide" paper, the platinum prints, and the permanent photographic prints; all of which depart from the sphere of the old well-known photograph, and approach more closely to wash drawings in sepia, sienna, purple, and black. But even those are not the nearest efforts to artistic productions which could be effected, for they still bear the undeniable imprint of mechanical manipulation. We do not by any means cast a slur upon mechanical products of this kind, for the world has much to be thankful for in the strides which this branch of copying has reached, and its power of giving such a vast collection of illustrations of scenes, pictures, and objects, otherwise obtainable only at a much higher price. The point is the simulation of photographs into artistic copies, and it is in this branch that the last two years have witnessed some marked progress. A writer in *The Amateur Photographer* gives in detail his own efforts to obtain a more artistic printing surface, and recounts his transactions with Dr. Hezekiel (of Berlin), Mr. Otto Scholzig (of London), and Mr. Blackie (of London), in his endeavour to get sensitised surfaces prepared upon Whatman's drawing paper and Arnold's unbleached drawing paper. By these means a large amount of success was obtained. Subsequently the Fry Manufacturing Company brought out their "Soltype" paper—which, although not rough, was yet a decided advance. It was not until a man with a distinct artistic turn of mind took the matter in hand that the point aimed at was reached. In the Carlotype Company one of the principal movers is Mr. C. F. Robinson, a Fellow of the Painter-Etchers' Society, and it is to his two-fold genius that the successful production of the mezzotype paper may be attributed. Knowing what was wanted, as painter-etchers usually do, to obtain the artistic element in a monochrome, he has probably been the means of producing a rough paper upon which photographs can be printed in a more uniform and desirable manner than obtainable on any paper previously made. In the hands of intelligent manipulators this mezzotype paper should do much to raise the status of photography to a level little removed from artistic work.



## Etching, Drypoint, Mezzotint.

By HUGH PATON,

*Associate of the Royal Society of Painter-Etchers.*

### ETCHING.

#### THE CLEAN PROOF.

**T**HE method of printing must form the subject of another lesson. It is a department by itself, and has its own

difficulties; so much so that many etchers leave it alone, and send their plates to the professional printer. But you must not be content with that, for experiment with the printing press is one of the greatest elements in the etcher's delight in his art. For the moment, however, we shall suppose that our plate has been to the printer, and that the proof lies before us. [See plate 2, first state, in No. 8, and bear in mind that it is a "clean" proof, designed to shew exactly what is on the plate.] And here I take the opportunity to say frankly, before proceeding to criticise the proof, that this is the subject of an early plate, and is used for illustration, not because of its technical perfection, but because it illustrates the errors into which the beginner is liable to fall. It has also been chosen, partly, because it illustrates the method of biting with three simple values, free from complication. The beginner is strongly advised not to attempt too much gradation of value until, at least, he has acquired some technical skill, and knows what he is about. A simple scheme of biting, like a simple theme for a subject, is much the best, and is more likely to be attended with success in one's early attempts.

Now, in the first place, you will notice that the proof has a bare, cold, hard look. Mr. Menpes speaks of the little shock of disappointment that always waits the enthusiastic etcher at the sight of the first proof of every plate. There is always more white paper than you have reckoned upon and a good deal of work remaining to be done. This is the universal experience. This feeling will, however, disappear to some extent when we see the full proof, but meantime we must examine the plate in detail. The large vessel and the markings on the water show strong, perhaps too strong, against the distance, and stand well into the foreground. The smaller vessel and the more distant lines on the water go well away from the eye, and the distance and sky are delicate, though quite distinct. The distance is rather faintly bitten, especially to the left, and we must try to strengthen it. The large vessel is too strongly bitten, but when the distance is strengthened this may not be so distinctly felt. The smaller vessel is wanting in colour; it is too bare of needle work. Then, as to

minor details, the lines of the larger vessel's rigging are too much of one strength; some of them are wanting in the delicacy that is characteristic of them in nature. The shrouds and stays which form, so to speak, the skeleton of the vessel's rigging, should be stout and business-like, but the rest should be light and delicate. We have failed to make sufficient distinction. Some of these should have been stopped out sooner, or drawn in later, in order to preserve the difference of value. Looking closely at the fore-topmast, it looks as if a little piece had been cut out; the needle has slipped this little bit somehow. Just above the yard of the mainsail is a faint line due to bad drawing, and there is another stretching out from the vessel's bow, due to the same cause. These have not been bitten, but are drypoint scratches made by the needle in drawing in lines which we stopped out before biting.

#### REMEDIAL MEASURES.

How, then, are these defects to be remedied? First, then, as to the larger vessel. We can reduce the strength of some of the lines of the rigging with the aid of the burnisher. With a drop or two of oil and a little elbow grease, this tool will reduce them to a more delicate value. The two scratched lines may also be removed in the same way, but first the edge of the scraper may be passed over them very lightly, in order to remove the slight edge of copper, called the "burr," which the needle has thrown up. The missing piece of the fore-topmast can best be supplied by the engraver's burin. The needle could supply the omission in a faint piece of work, but here it would not be strong enough. The copper must be ploughed out by the burin, and this must be done very carefully, because the burin point has a way of slipping when you least expect it, and without great care you will damage the plate. The small boat wants solidity, and you may add a few light lines with the point of your needle on the bare copper, using a fair amount of pressure. We could remedy the bareness of the needle work in the smaller vessel by grounding the plate again and adding work to it, but all that trouble is hardly necessary in this instance. Get your plate in a good light, and with the aid of a magnifying glass, if your eyes require it, draw some drypoint lines very carefully between the etched lines of the sail. Do the same between the lines of the shadow, both on the sail and on the stern of the boat. The side of the vessel is also rather flat, and you may put a few touches of the same sort at both bow and stern, to give it form. The distance is rather white and bare, especially on the hillside, and you may add colour there by the same means. In all these cases, apply only a moderate amount of pressure to the needle.

#### RE-BITING.

Now we come to the most important defect, the weakness of the distance. This is a defect which the old etchers would have had great difficulty in remedying, but we shall try to manage it with the aid of the roller, although in work so faint as this it is not always successful, owing to the difficulty of grounding the plate without filling the faint lines. Here is a roller, which, as you see, is a wooden cylinder covered



PLATE III.—ETCHING—FINISHED STATE.

(TO ILLUSTRATE A GRADUATED BITING.)





with a piece of fine calfskin. It has handles at the ends, by means of which it can be pushed over the plate, with or without pressure, as may be required. Here also is some etching ground in the form of a paste, made by mixing a ball of the ordinary ground, when warm, with spike oil of lavender. It should be, when cool, of the consistency of honey in winter. We spread a little of this, with a palette knife or the dabber, on a sheet of glass or a spare plate, and pass the roller over it in various directions until it is evenly distributed. Now pass the roller over your plate, which must have been cleaned and laid ready to hand on a sheet of glass, two or three times, but not more. Once forward and backward along the plate and then the same across in two directions should be sufficient, if the ground be in right order and the roller rightly charged. The film should be very thin or the ground will clog the bitten lines. If there be rather too much ground on the roller, it may be put right by passing it over a spare sheet of clean glass or a spare plate, which takes the superfluous ground. A look at the surface of the plate will shew whether it is all covered, as the ground is duller than the pure copper. Next heat the plate very slightly and very gently, and until the ground shines, but do not smoke it; then leave it to cool. Now paint over with the stopping-out varnish all but the distance which has to be rebitten. You may pass your brush at once over the whole of the water and the two vessels. Use a little care with the latter, in order not to paint out any of the faint work of the distance at the same time. This done and the varnish dry, the plate is ready again for the acid. The distance to the left, however, is a little wanting in interest, so you may draw in the steamer at the pier. Now apply the acid as before described, but a little weaker, and watch it carefully in a good light, as the colour of the bubbles will not shew so distinctly against the unsmoked ground. But hold hard! We were forgetting that the steamer will require a few minutes longer than the rest, which is already partly bitten, so with the pipette put a little acid over it alone, and let it have about five minutes' start. The acid being weaker, it will require in all more than the five minutes allowed the distance before. When the time is up, pour on what acid you require to cover the rest of the distance. Presently you will detect the blue bubbles, if we have been lucky in getting the plate properly grounded without filling up the lines. Allow the acid to remain for three or four minutes more, and the work is done. In a case of the sort, violence has to be avoided, and we have therefore weakened the acid slightly and allowed a correspondingly longer time for the biting.

#### THE FULL PROOF.

Now we must turn to the full proof for results. [See plate 2, finished state, in No. 9. And I should like to interpolate here, writing with the Meisenbach reproduction of the original proof from the plate before me, that while the illustration retains in a marvellous way the general character of the original, it fails, as from the nature of the process, which is a method of surface printing, it must fail, to show some of its finer qualities. Some of the very faintest lines which show clearly enough in the proof from

the plate have disappeared, or can only be traced by one who knows where to look for them. The reader will please bear this in mind. He will be able, however, to follow the criticism in the text without any great difficulty.] You will notice at once that the "full" proof is stronger and richer than the first "clean" proof. The difference is mainly owing to the method of printing, which will be explained in due course. The large vessel, we now see, is altogether too strongly bitten. We have not sufficiently allowed for the start which the already partly-bitten work takes of the freshly-drawn lines in the second and third bitings, and it would have been better had we only allowed ten minutes for the first one. This we must be on our guard against in our next plate. As a result of over-biting, the hull is too black and destroys the idea of air and light between it and the eye. The sails are also too heavily bitten. Though they are in shadow and tell dark against the sky, the local colour should still have made itself felt. Five minutes less for the first biting would have kept the values in better relation. The smaller vessel is now full of colour, and comes better away from the distance, without coming too near. This combination of the drypoint with the etched line is sometimes very useful, though that is a point upon which I shall have more to say later on. The distance also has more body without being too strong. We have been exceedingly lucky in getting it to bite so evenly, as the roller, however carefully managed, is apt not merely to fill the faintly-bitten lines, but to fill some of them and not others, with, of course, unequal work in the rebiting. For strong work, however, there is practically no difficulty in grounding by this method for rebiting. The drypoint touches on the small boat and the distant vessel's hull, as well as on the hillside in the distance, have given the additional colour required. The two drypoint scratches about the larger vessel have disappeared, and the lines of the rigging shew more variety of value. A quick eye, however, will detect the marks of the burnisher, especially along the line between the two masts (these have disappeared in the illustration, although they showed distinctly in the original). This is due to want of care in the use of the tool, or perhaps it has not been kept properly polished. In the process of polishing down the lines of the rigging, we have polished out altogether some of the faintest lines of the sky, so we have replaced these by a few light drypoint lines, which are quite in harmony with the rest.

#### TO ADD WORK ON THE PLATE.

We have not had occasion this time, as happens oftener than not, to reground the plate for the purpose of adding work to it. It is, however, so often necessary that I must describe the method of doing so. There are two methods which are equally convenient, the essential principle being that the work already on the plate has to be protected from the acid. Therefore, unlike the method of grounding for rebiting, the surface of the plate must not only be completely covered as before, but the lines already bitten must be filled with the ground. This can be done by rubbing into the lines with the finger a little of the paste ground, with which a small quantity of

lampblack has been thoroughly mixed with the palette knife. Enough oil of lavender should be added to make the paste workable. Keep the plate warm but not hot. As it cools, wipe off what is superfluous of the paste with a piece of printing canvas, using the rag in such manner as to clean the surface of the copper without dragging the paste out of the lines. The plate may then be grounded as already described with the liquid ground. The other method is to finish off by grounding with the roller in the manner already explained. Greater pressure may be used as it is no longer necessary to leave the bitten lines empty. But all this involves the trouble attending the use of the roller, and the liquid ground is simpler in all ordinary cases.

It is quite necessary to adopt this method of filling the lines already bitten before regrounding the plate, because the ground would otherwise have a tendency, while protecting the surface of the metal, and perhaps also partially filling the lines, to leave the two corners of all strongly bitten lines exposed, and you would find, when the acid began to work, that it was attacking the old lines before the new ones had fairly started. A simpler method is to reground the plate with the bare ball, rubbing it well into the work already bitten, and finishing off with the roller, or the dabber. But the latter is always to be avoided for fear of dust. Besides, the former method allows the work already done to be clearly seen, which is the main object in view.

All strongly bitten work must be treated in the manner just described. For a delicately bitten plate, however, I have found it sufficient to pour upon it rather more of the liquid ground than is required to merely cover it, and allowing it to dry with the plate in a horizontal position. The ground runs into the lines and fills them sufficiently to protect them afterwards. But the protection afforded is not sufficient if the work already on the plate be at all strongly bitten.

The plate should now be smoked, if at all, only slightly, but not to the extent of obliterating the work already done. Add the needle work required, and bite as before, but watch very carefully the edges of the stronger lines already bitten, as the acid is apt to find its way through the ground at these points. When such a thing happens, off with the acid and stop out the weak parts before proceeding further.

Had we not succeeded with the rebiting of the distance in plate 2, we should have had to reground the plate in the manner just described, and then go over it with the needle, and a magnifier if necessary, drawing each line over again so as to clear the new ground out of it. Of course, on an elaborate plate, this would be a process of great difficulty and labour, hence the value of a good roller and a light hand in using it, as well as a paste ground that is in good working order.

#### WORKING BY STAGES.

The method of doing the work piece by piece, and biting by stages, is a modern one. The old etchers would have drawn in the whole of the work, and obtained their values by stopping out between the bitings. For example, after the whole work had been drawn upon this plate, they would have subjected it to

a biting of perhaps five minutes, and would then have painted out the sky and distance. After a second biting of, say, seven minutes, the distant vessel and the lines on the water, also the more delicate of the ropes of the larger vessel would have been likewise disposed of, and the remainder of the work exposed to the acid for a further ten or fifteen minutes. This would have left the account much the same, and in a simple subject of this sort, in which the values do not, so to speak, overlap one another, the time spent upon the whole of the work would have been about the same. But in a more elaborate plate it would be a more serious matter. Imagine the labour of stopping out, say, a delicate sky between the intricate branches of a tree! I believe the old etchers had a rule-of-thumb something to this effect, "one hour with the brush is worth five with the needle." But there is no inherent difficulty in drawing only the strong work at first, leaving the rest to be filled in by stages. It is only a matter of a little care in placing the foreground objects right; the rest will all fall into place without difficulty. Therefore such an expenditure of time and labour in stopping out would seem to be quite unnecessary. [I speak here of working direct from nature. When drawing from a prepared sketch and using a tracing there is, of course, no difficulty whatever, as you can draw in only the strong work previous to the first biting, and the remainder follows as required at each stage.] But you will do well to bear in mind both methods of working, for, as a matter of fact, most plates are put through by a judicious combination of the two. In general practice you will follow mainly the process I have described, but will adopt the method of stopping out when it suits you to complete the drawing of several values before the first biting, in order to pull the subject together; or when, as often happens, you find that some portions of the work are already strong enough, while others still require additional time under the acid. I must point out to you that the method of working by stages enables you to throw light shading across an object in the foreground with the greatest ease. In some classes of subject you will add work to the foreground at every stage. Take, for example, the trunk of a rugged tree in sunlight. For the first biting the rugged markings must all be drawn in; for the second, the general colour of the side that is in shadow, as well as the strong shadows under the prominences; and any further colouring on the light side will be added previous to the last biting. Sometimes the *outline* on the light side can be stopped out with advantage after the first biting, as it is manifestly easier to draw both sides of a trunk and branches than to leave one side undrawn till a later stage.

#### GRADUATED BITING.

Before leaving the question of the method of biting, let me say that the rough and ready method I have explained (I mean that of pouring the acid over the plate instead of plunging it bodily into the bath), though not orthodox with your "proper" artist, has several important advantages, and is at the same time sufficient for all practical purposes. I have not used the bath in the orthodox way for many years. A great advantage of the method is that it obviates



the necessity of painting the back of the plate beforehand and waiting for the varnish to dry, though this is only a matter of a little trouble. Indeed, since Mr. Herkomer has made known a stopping-out varnish which dries instantly, namely, a solution of shellac in alcohol, the trouble and delay may be said to be of the slightest. But a very important point is that a graduated biting can be obtained with great nicety, such as can be got in no other way. It is especially useful for the gradation of the sky, and such parts of the landscape as run away from the eye, such as a hedgerow, or a row of buildings receding into distance. Indeed, I have thought this of sufficient importance to illustrate by a special plate (see plate 3). If you give me your attention for a moment, I shall describe to you just how it was bitten, and you can try the method for yourself. The acid was used rather weak, as I wanted delicacy, and wished to avoid the error into which we fell with plate 2, by overbiting the foreground. This subject was done in three bitings, all graduated. The centre group of shipping was first drawn in, only the lighter lines of the rigging being left over, and the plate was submitted to the acid for some eight minutes. But the acid was laid only over the first vessel for two or three minutes before being passed over the rest. Then the lighter lines were added in the rigging, and the shading on the sides of the vessels; also the shipping only on the right drawn in, the buildings being left till later. This was done because it was desired to bring the vessels out from the buildings behind, and they required a little preliminary biting. During the second biting, of about the same duration as the first, the acid was managed in the same way. It was allowed to lie on the largest vessel first, for a minute or two, before being passed over the rest, and it was placed over the small schooner to the extreme right for probably four minutes, and then passed over the other vessels with the feather at intervals of about a minute. As soon as the acid was applied to the largest vessel, I began with the right-hand side, then returned to the centre group, passed it over the whole of that, and back to the right again. In short, the two bits of the plate were kept going together. There was no difficulty about it; it was only a matter of a little care and attention. With the feather dipped in saliva and the acid supplied from the pipette as required, it was guided with the greatest nicety just where desired. This left the total biting of the centre group about fifteen minutes, with enough time in hand to allow of the distance being added. Then the whole of the needle work was completed, the buildings, distance, and sky, with any lighter lines on the water, being added to the former work. The last biting had to be managed very carefully. Calculating that the centre group would be sufficiently bitten when the additional five minutes or so that the distant bridge would require had been given it, I gave my attention to the right-hand side only. The acid was placed on the vessel and buildings to the extreme right, and after about three minutes it was passed on with the feather over the second group of buildings. After perhaps another two minutes, it was carried carefully along the quays

and across the plate so as to cover the bridge, and given a minute or so to get a start before it was carried over the distant buildings and the sky. A final four or five minutes completed the biting. The difference in value between the middle block of buildings and the extreme distance was obtained partly by the difference of time in the biting, but partly also by the difference in the character of the needle work. By shading the secondary block of buildings with closer-drawn lines, so as to obtain the effect of tone, the necessary variety in the treatment of the buildings was obtained. The small group of vessels to the extreme left was put in before the second biting, and managed in a similar way. A few drypoint lines have been added in one or two places, but with that exception the plate is exactly in the state in which it was found when the ground was cleaned off and the first proof taken. From all this I think you will see that such nicety of value could not be obtained by a series of bitings in the bath, or by frequent stopping-out with short bitings between, without, at least, very great trouble. The method is at once so simple and effective that it is well worth a little trouble to master it.

*[To be continued.]*

A MULTIPLE COPYING INSTRUMENT invented by L. Kleritj, of Belgrade, Servia, in 1891, consists of a number of pencils or pens attached to a rod having two pivoted arms and a connecting piece at the other end, the whole forming an articulated parallelogram resembling the ordinary pantograph. The two arms slide in a longitudinal direction through sockets turning in a fixed support, the rod supporting the pencils, etc., moving freely in all directions. Thus the rod carrying the instruments will always prove parallel to itself, so that any motion given to one will be repeated exactly by each of the others, the instruments being free to move to any point within certain limits. They are caused to bear upon the paper by means of adjustable springs pressing at one end against a collar on the pen or pencil and at the other against the aforesaid sockets, thus keeping them always on the paper. The sockets are rigidly connected at the top to a bar, so that they can all be raised from the paper at once without raising the main rod; the rods forming the parallelogram and the supports may be arranged either vertically or horizontally.

A READY means of obtaining a tracing of any subject upon white paper, so that it may be finished in colour or washes with outlines, etc., is to pin it over the design and rub lightly with cotton wool soaked in very pure benzine. As soon as the benzine is absorbed, and the upper sheet thereby rendered transparent, the artist can trace over his design either with pen, pencil, or brush (washing). There need be no fear of the lines or tints spreading, nor of the paper shrinking or rising. The tracing finished, the tracing-paper is removed, the benzine evaporates, and the paper recovers its primitive opacity. When the design is large, the benzine must be applied several times.

## The American Poster.



HE American poster has utterly changed its standing since the printers have been producing their work by lithography, says the *New York Sun*. It has become an artistic creation. Woodcuts may be as

fine and delicate as etchings, but in poster work they depended on their coarseness. They needed to be bold and conspicuous, and the printing of them required such a great amount of ink that any fine work that might have been done upon them would have clogged up and become a great blot. The old-fashioned poster picture was always a woodcut, and was always coarse and rude.

With the advent of lithography into the business, not only artistic drawing, but brilliant colour effects became possible. The Americans found few artists here who were accustomed to the work. There were famous painters who were masterly in their use of colours, but it was not possible to employ them in a calling that had not then attracted wide attention, and that in all probability never will rank as nearer than cousinship to high art.

Moreover, lithography is a science by itself. It does not permit the execution of the design that is aimed at. It requires the artist to reach an effect indirectly by drawing a picture as a looking-glass reflects a figure, with the right side of the stone making the left side of the finished work. The best artists who have mastered this trick are the cartoonists upon the leading weekly papers that produce pictures in colours.

The number of men who were competent to produce the American poster of to-day was very small when the printers took up lithography. Europe, however, was a rich treasury of clever draughtsmen and colourists who were trained to lithographic work. To Europe the American poster printers went for their talent, and the consequence has been that to-day the leading poster artists in this country are nearly all Europeans. They are Frenchmen, Germans, and Russians. They have been imported in this country as fast as they have attracted attention in their own capitals, and the custom of recruiting their ranks with men of their own nationalities still goes on.

The American poster is, therefore, in one sense a foreign product. The artists, the process, the lithographic stones—all are brought from abroad. Even some of the paper in use on the dead walls of the country, though made here, is manufactured of fibre that is imported. But the finished product of this foreign combination is as truly American as the enterprise and judgment that led up to it. So American is our poster, in fact, that to-day the most attractive fence and wall advertising done in London, Paris, and Berlin is printed in Cincinnati and New York.

It is not merely the Barnum circus, the Kiralfy spectacle, or the series of Yankee patent medicines that are thus exploited abroad. The Europeans

themselves send here to get their posters. It is a curious circumstance that the same artist who in Paris turned out an artistic but old-fashioned, unattractive little placard, now sends from America to the same Paris firm the stunning, showy, beautiful designs that are everywhere classified as American.

There are no secrets in the making of the new style poster, except that the biggest, most successful printers are those that employ the best talent, show the most enterprise, and spend the most money for the best materials and machinery. They give out the figure work to the figure men, the lettering to the best designers, the colour work to the men whose skill as colourists has attracted wide attention. They pay good wages. There are poster artists who are getting \$15,000 a year, or perhaps more than any painter or illustrator on any magazine or in any studio in this city.

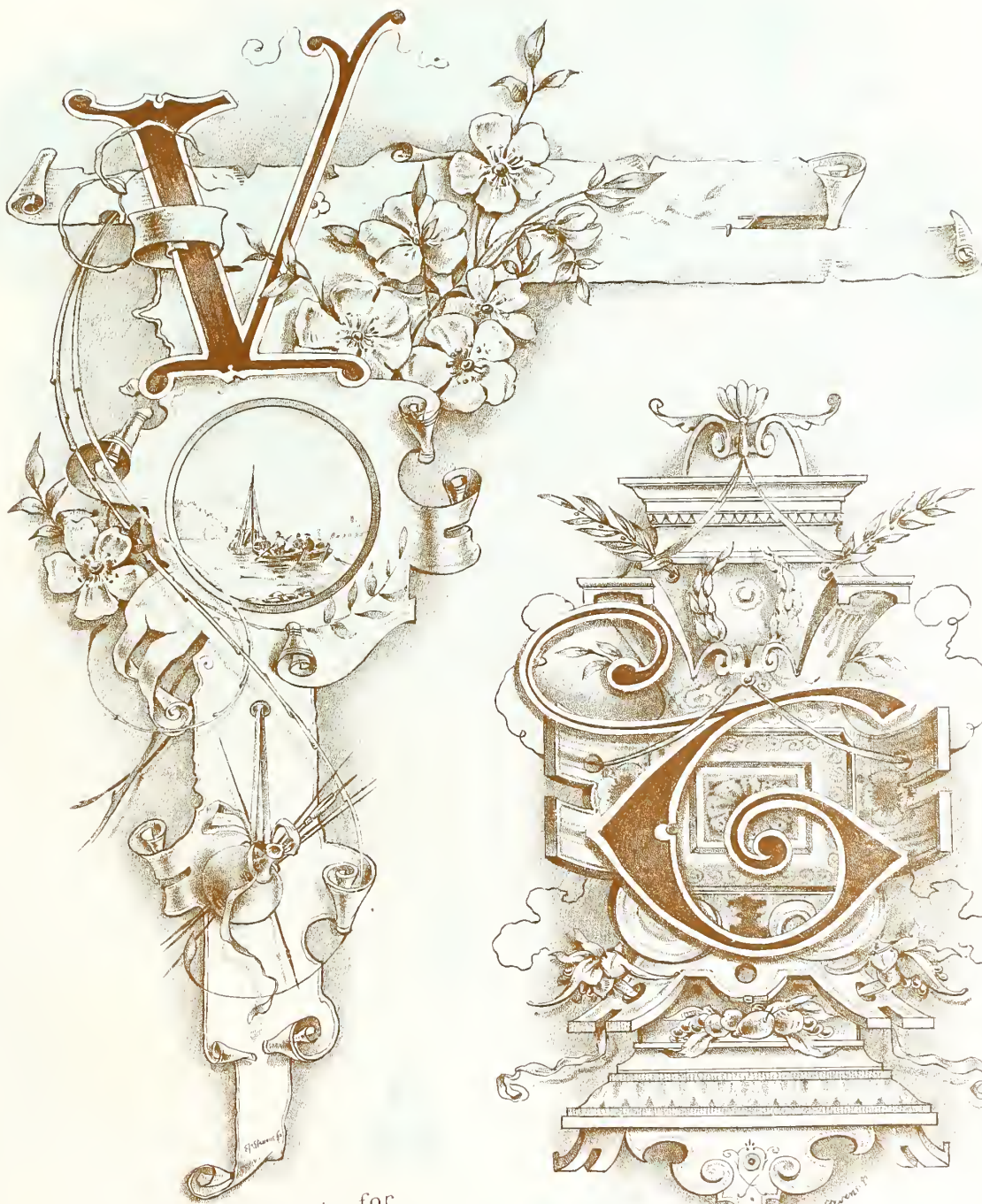
The fidelity of the likenesses to the originals in the theatrical bills is due to photography. There are no portrait painters in the new poster shops. The actor or actress who is to be portrayed—as in the case of the famous portraits of Mr. Crane as the Senator and Johnstone Bennett as Jane—were, if they are like the rest of their kind, photographed up to the required size, and then the photograph was used as the basis of the drawing or painting. Effective scenes and situations are seen by the artist in the same way that any spectator in an orchestra chair sees them, except that the actors and actresses often pose for him alone, and their photographs are carried away by him in his notebook.

It has been said that nearly all the leading poster artists are foreigners. It is true, therefore, that a few are Americans. One of the very best of them all, whose figure work attracted wide attention, was a Mr. Crane, who until lately lived and worked in this city, and there are now in town at least two other first-class figure men, who, like half-a-dozen famous painters and illustrators, graduated from the art department of the now defunct *Daily Graphic*. To step aside from the actual poster, there are found in the workshops of the great bank-note companies other Americans employed as designers in the main.

The good work done on our dead walls has wrested praise from the men who are engaged in the higher lines of artist industry. It was at a dinner given to Henry E. Abbey, when the best artists in the country were present, a couple of years ago, that a toast was drunk to the American poster. With no unhealthy prejudice to break down, and in view of the money that the printers are spending, it is safe to predict that Americans will contribute more and more to the glory and success of our poster, until at last it will be American in fact, from its ink surface to the paste on its back, with all which that implies.—*American Paper Trade*.

AMERICAN LITHO STONE "BOBS UP" AGAIN.—Lithographic stone which is perfectly clear and without a blemish has been discovered in Arizona, samples of which will be dressed and exhibited at Chicago's great fair. The deposits cover one hundred acres at one point.—*Paper World*.





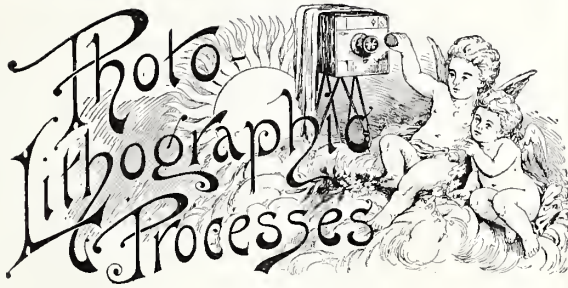
SUGGESTIONS. Initials for  
Illuminating.

Printed on Grosvenor, Chater & Co's "Acme" Printing Paper.

De Montfort Press Litho.







## CHAPTER XI.

THE PREPARATION OF THE SUBSTRATUM  
FOR THE COLLOTYPE FILM

[continued.]

**I**N chapter X. a description was given of all the ordinary colotype methods of preparing the plate with a substratum before putting on the sensitive film. In those methods there is a certain amount of simplicity, but in the method about to receive attention, the procedure is more complex. The only reason

for giving this method is that these papers shall contain descriptions of all the methods in use, so that a manipulator will be able to give each one a trial until he meets with success.

In this process, known as Allgeyer's, the substratum consists almost of a sensitive film. It is prepared from two separate mixtures, consisting of:—

- |                              |           |
|------------------------------|-----------|
| (1) White of eggs .. .. .    | 30 parts. |
| Water .. .. .                | 30 "      |
| Ammonia .. .. .              | 5 "       |
| (2) Gelatine .. .. .         | 1 part.   |
| Potassium bichromate .. .. . | 1 "       |
| Water .. .. .                | 30 parts. |

These solutions must be well filtered after mixing, and finally mixed at a low temperature, not exceeding 32°C. The mixture is poured upon the glass plates, which are kept at 30°C.; and by means of a glass rod it is spread evenly over the plate. The plates are dried at a still lower temperature, viz., 22°C. The plate is then treated in the same way as described by Herr Albert. The glass is thoroughly cleaned, the film dusted, and then placed film downwards on a black cloth. Light passes through the glass, and hardens the substratum to such a degree that when slightly damped a perfectly clean, clear scratch can be made with an instrument.

Whereas in Herr Albert's and other methods described this substratum is quite sufficient, in the present process it is further supplemented by a second adhesive layer or film, prepared by mixing:—

- |                              |              |
|------------------------------|--------------|
| Gelatine .. .. .             | 20 parts.    |
| Water .. .. .                | 300 to 350 " |
| Alcohol .. .. .              | 30 "         |
| Glycerine .. .. .            | 1 part.      |
| Potassium bichromate .. .. . | 1 "          |

This is spread over the previous substratum and allowed to dry; it is then exposed in diffused light. Or after drying, it may stand a day; then it is washed and dried rapidly. At that stage it is ready to sensitise,

and will remain in good condition for some weeks. Thus, after two distinct substratum layers, the plate is just in the same state as those previously described in chapter X. It is claimed that the second layer assists in the retention of moisture during printing.

In confirmation of the single substratum method, Messrs. Morgan & Kidd, who have recently published the supplements in the *Yachtsman*, state that they use only one substratum.

## CHAPTER XII.

THE COLLOTYPE FILM.—PREPARATION OF THE JELLY  
AND SENSITISING SOLUTION.

Collotype is practised with so much success by many practitioners, that it would savour of egotism to say distinctly that one or other method is the best. Results are perhaps the best proof, and scarcely better proof can be shewn than recent publications by Messrs. Morgan & Kidd. Not only has this firm (January 30th, 1893) demonstrated their process in detail, but on a recent date has exhibited its work (on February 23rd, 1893). The details thus divulged, shew that the sensitive jelly consists simply of:—

- |                                 |           |
|---------------------------------|-----------|
| Middle hard gelatine .. .. .    | 50 parts. |
| Distilled water .. .. .         | 500 "     |
| Bichromate of potassium .. .. . | 11 "      |

Closely resembling this formula, is that given by Mr. Wilkinson, and containing:—

- |                                       |           |
|---------------------------------------|-----------|
| Creutz's middle hard gelatine .. .. . | 2-0Z.     |
| Distilled water .. .. .               | 10-0Z.    |
| Bichromate of potassium .. .. .       | ½-0Z.     |
| Liquor ammonia .. .. .                | 20 drops. |

To prepare the jelly from these recipes, the gelatine is soaked in a jar in the cold water until soft. The jar is put into a saucepan of cold water and placed on a gas stove. The temperature is gradually raised sufficiently to dissolve the gelatine entirely without causing it to coagulate. The temperature should not exceed, nor scarcely reach, 180°F. The bichromate of potassium, ground into a very fine powder, is then stirred into the warm gelatine and dissolved. Finally, the ammonia is poured in and well stirred; after which it is allowed to stand to set in a jelly.

At this point there is a divergence in the practice by different manipulators. Some use this stock jelly as it is, by simply re-dissolving and coating the plates. Others take a portion of the jelly, place it in a clean jar, and re-dissolve it by heat in a pan of hot water. The amount is measured, and the same amount of pure methylated spirit is put into a vessel and placed side by side with the jar in the pan to raise it to the same temperature. The spirit is then added slowly to the gelatine whilst stirring, to prevent coagulation, and when well mixed, a drop or two of liquor ammonia is well stirred in. The mixture is filtered through muslin and returned to a vessel kept warm, from which it is poured out again, through muslin, upon the glass plate with the dry substratum upon it. In all these manipulations it is necessary to keep every vessel warm, and finally warm the glass plate before receiving the sensitising film. A plate 13 × 10-in. requires about six drams of the film to cover it, or for each square foot of surface allow one ounce of sensitising solution.

In the foregoing details another difference is made by some manipulators, which assists in giving the grain to the finished film, and that is, instead of adding ammonia to the spirit and gelatine solution, add a few drops of either acetic or tartaric acid. For the same purpose, some finely pulverised glass or flint might be used, but it should be borne in mind that Creutz's gelatine is of such a nature as to give a fine grain without any assistance by organic acids or insoluble powders.

It has already been shewn that in these preparations of sensitising films, there are other alkaline compounds of the bichromate as suitable as potassium. In Messrs. Morgan & Kidd's formula, the eleven parts of potassium bichromate can be substituted by ten parts of ammonium bichromate.

Reverting to the nature of the sensitising film, there is the formula of Dr. Schnauss which is used successfully in some parts of the Continent. It consists of:—

Gelatine . . . . .	6 grams.
Distilled water . . . . .	70 ccm.

which is soaked, dissolved, and filtered, as already shewn. After the filtering, 8 ccm. (8 grams) of a solution of ammonium bichromate (containing 1 grain of the ammonium salt to 7 grams of water) are well stirred in, and the whole again filtered before coating the plate.

Another Continental formula is that known as the Portuguese method, practised and brought to perfection by Senhor Carlos Relvas, whose formula is somewhat complicated. In the first place, two solutions are prepared separately and kept as stock bottles, consisting of:—

- I. Sodium chloride (common salt) 1 gram (15'432 grains).  
Water . . . . . 500 ccm. (or grams).
- II. Sulphate of alumina . . . . . 1 gram.  
Water . . . . . 100 ccm.

These solutions are used to form the complete film in conjunction with other ingredients, as shewn by the following recipe:—

Gelatine . . . . .	27 grams.
Water . . . . .	400 ccm.
Bichromate of potassium . . . . .	9 grams.
Preparation I. (as above) . . . . .	15 ccm.
"    II. " . . . . .	15 ccm.

Of this solution it requires from three-quarters to one ounce to cover a square foot of the plate.

The formula used in Allgeyer's process (already referred to in chapter XI.) to obtain the sensitive film consists of:—

Gelatine . . . . .	10 parts.
Water . . . . .	150 "
Bichromate of ammonium . . . . .	3 "

which is compounded in the same manner as previously described.

Throughout, these recipes are subject to the same method of preparation, and the same precautions as to filtering and keeping warm. The heat retained may differ in each case, but as a general rule 40° to 45°C. may be considered a suitable temperature.

Having decided which formula to use, and carefully preparing it, the dry glass plates bearing the substratum are brought out and dusted. Before, however, pouring the collotype film on, it is most important to have everything in a perfect state of

preparation so that the film on the plate may be immediately set to dry. The drying of the collotype film can easily mar or make the plate, as will be shewn subsequently. But for the present it should be understood that the drying box consists of a box closed against the invasion of dust, possessing means for ventilation in order that the film shall not be baked, but dried; and having a convenient door for putting the plates in at. This box can be heated to any extent up to boiling heat, by a closed water tank on which it rests, the water tank receiving its heat from a gas stove beneath. Within the box, iron bars are fitted, each tapped in various places and carrying thumb-screws through theseappings. By means of these screws and a spirit-level, all plates are put in before receiving the sensitising solution, and are perfectly levelled and warmed to the necessary heat. Immediately the sensitising film has been poured on, the plate can be returned to the box and dried in a perfectly level plane.

There is a certain knack, as there is in most of these photographic processes, of pouring solutions on plates to obtain an even layer. Perhaps one of the simplest is to balance the plate in the left hand, so as to allow the wrist and arm to move easily. Then dust the plate perfectly clean with a soft brush. Now pour on a certain quantity, about twenty-five per cent. in excess of the amount necessary for the film layer, previously measured and kept warm. The glass plate with its substratum being also warm, it allows the opportunity of manipulating the plate in the left hand to obtain an even flow all over it, and finally pouring off the surplus film solution into a measure to be sure that too much is not being withdrawn. By this means any amount of film solution can be readily put on the plate, and its exact measure known.

A method of pouring the film which recommends itself as a good initial step for the amateur, is to balance the warm glass plate as evenly as possible on a large cork in a bottle. The film can then be poured on from a measure, and may be assisted to cover the plate by a glass rod (previously warmed). A certain quantity of solution can be withdrawn by pouring it into a measure from the plate. But the utmost care must be exercised in keeping the plate level during the operation of pouring on the film and transferring it to the drying box, for however slight the inclination of the plate may be, there is a tendency for the film to run thin.

The film having been spread, it remains only to be dried in the box, a description of which is reserved for chapter XIII.

[To be continued.]

PAINTERS & ENGRAVERS.—Photographic engravers frequently get into disagreement with artists in the reproduction of their works. Usually the work has to be done to the satisfaction of the painter, and he is often a "faddist," and has strange ideas as to how his different colours should be rendered in monochrome. Often a misconception of terms as used by the painter and the engraver exists, and this sometimes leads to unnecessary alterations, to the serious deterioration of the work, in order to conform to the painter's ideas.





## A Leaf from the Frenchman's Book.

... II. ...

A. VALETTE ON PHOTO-LITHOGRAPHY.

### PRODUCTION OF TRANSFERS.

**I**N view of these difficulties we carried on our investigations by trying another mode of inking, which consists in dabbing the proof with a dabber charged with lithographic transfer ink. Here, as in the former case, we did not obtain a very good result from the beginning. Our groping after the method arose in the error into which we had been led of believing that it was necessary that the print should be well supplied with ink, after having submitted it previously to a cold water bath for ten to fifteen minutes. However, much talent and goodwill must be brought to bear upon his work by the lithographer. If the negative of the plate is not perfectly opaque, and if the frame used to take the print is not hermetically closed, it will be very difficult for him to clear his print completely of the excess of ink which, under the pretext that there are no breaks, he may have put in. On the other hand, if the dabber he uses has not the proper texture (or web), certain threads, fluff, and dust will be left on the ink and paper, which will break the lines or alter their purity.

We at last saw our investigations crowned with success by proceeding as follows in inking the photolithographic prints :—

When the print appears clearly delineated in a *warm brown* tone, it is taken out of the frame and immediately immersed in a basin of cold water, in which it is left not more than thirty seconds ; it is then taken out and spread upon a glass plate or any other solid support, free from wrinkles or furrows, and inked with a dabber made of two folds of very soft old flannel, filled with tufts of cotton wool, so as to be about the size of the fist ; it should be closed tightly without, however, making it too hard. In order to avoid the deposit of light filaments while dabbing, the dabber is slightly singed by passing it over a flame ; this dabber is inked with a little lithographic but not transfer ink ; simply pour a few drops of turps on the black ink slab and dab it over until the dabber is well inked, but not charged too much. Then ink the print just taken out of the bath with it, being careful not to wipe off the water ; on the contrary, if this inking is done in broad daylight, it is necessary to have it continually wet.

The inking is done by dabbing very lightly and regularly every part of the drawing ; it is not a rare occurrence then to see the latter perfectly well inked without the dabber depositing its ink anywhere else ; in case the print is not very perfect, or the ink has

been deposited over the whole surface or a part of it, the drawing can be completely cleared by wetting the sheet, and dabbing it over again with the same dabber used for inking. It is unnecessary to use two dabbers to ink and to clear the print. If the gelatine paper is of good quality, if the time of laying is rational, the printing plate entirely opaque and the print to a nicety, a large print can be inked in this manner in a few minutes, without having an excess of ink, as is the case when inking with the roller. It is enough that the print should be entirely visible, and it is almost indispensable that it should be rather grey than too black in order to obtain a reproduction of crayon or pen drawings or outlines, the niceties of which it is desirable to preserve. This is the stumbling block of most lithographers—the reproduction almost always becomes thicker, because the gelatine is allowed to decompose, whereas with the mode of inking which we recommend, the print is sufficiently inked before the gelatine is completely swelled, the swelling being more slowly produced, from the fact that the paper has remained a short time in the bath, and that during the operation of inking the paper has been wetted only on one side. If by any accident the print becomes too much charged with ink, wash it out immediately with turps, in the same manner exactly as if it were a subject on a lithographic stone, but being careful to keep it constantly wet, inking it over again, clearing and cleaning your dabber. The print obtained being perfect, lay it to dry in sheets of fine blotting paper or a box hermetically closed, where no light can penetrate. A paper entirely damp requires two or three hours to dry. As the gelatine retains the humidity long, the print thus inked can be preserved three or four days ; it would be preferable, however, in view of the lightness of the inking, to transfer it the same day. The transfer presents no particular difficulty ; take out the dry photo-transfer and place it between some sheets of damp, unsized paper until the gelatine becomes sufficiently soft to stick on the stone when transferring. It is absolutely necessary not to leave the sheet too long in the damp, as you would thereby run the risk of causing the gelatine to slip (or slide) in the transfer, thus losing the print. Transfer in the usual way, by damping the back of the sheet ; after running it through four or five times, the inking being very light, the transfer must be taken care of ; run it through a dozen times, then wet the back of the transfer with the sponge, and allow the moisture to thoroughly penetrate before removing the print ; gum the stone and allow it to dry, then proceed to the operation of inking as if it were an ordinary transfer.

As can be understood from the above statement, the methods of preparing the photo-lithographic transfer, which only a few years ago seemed to be impracticable, are at present in the hands of any practical man who can bring perseverance into his work.

*The Gum Process.*—The results which have been obtained from this process are not precisely conclusive, but we have observed, however, that niceties could be obtained therefrom which it is impossible to obtain with the gelatine paper, and this is easily accounted for. Here we have not to fear, as in the

foregoing process, the swelling of the gum, for it, in the former case, this swelling causes the lines to thicken, here it is exactly the contrary that happens.

We will give the processes of MM. James, Geymet, and La Follie :—

Prepare a solution of gum arabic of good quality, by dissolving 1,543¼ grains of gum in 2,315¼ grains of water. This dissolution takes rather a long time, requiring six or seven hours; it may be hastened, however, by stirring it frequently with a wooden spatula, or better still, by dissolving the gum in hot water kept always at the same degree of heat. When the gum is completely dissolved, pass it through a very fine sieve, previously provided with a piece of linen to prevent the passage of the gum settlings. Dissolve in any vessel, preferably a bottle, a certain quantity of bichromate of potassium; it is not necessary to state the exact quantity, any quantity may be used, for when the water is charged, the rest of the bichromate will not dissolve unless the water is increased. Mix equal parts of the dissolved gum and bichromatised water, avoiding the formation of air bubbles, which would produce swellings on the paper and as many defects on the print produced. This mixing should be done, as far as practicable, in the same basin used to prepare the paper. Obtain from any dealer in photographic supplies some albumenised paper, and float it on the above mixture; the time of this immersion should not exceed four or five minutes. This preparation is extremely sensitive, and it is therefore indispensable to work in the dark room. Lift the sheet very carefully and hang it to dry in the dark room.

M. Geymet gives in his treatise two minutes as the time of exposure, even in the shade; we beg, however, to question the assertion of this eminent artist, as we believe that it is very difficult to fix the time exactly, which may vary according to the degree of intensity of the plate, and the more or less perfect manner of closing the frame. It is very necessary to obtain a sufficiently strong pressure in the frame, which pressure can be regulated and increased by a more or less thick layer of paper. The print must scarcely show. It should be understood that in order to obtain satisfactory results everything must be first-class :—

- (1) The preparation of the paper.
- (2) A printing plate not only faultless, but even better, excellent.
- (3) The exposure, above all, must be very successful, unless in order to utilise the prints which have undergone an over-exposure the following operation was employed, which has given us results we did not expect to obtain.

We took, one day, a print which had had a very long exposure, to the point of becoming of a yellowish brown tint; knowing that we could not use it for a direct transfer, it occurred to us to ink it like a gelatine print; that is to say, dipping it completely in a basin of water and taking it out immediately; we then inked it without loss of time by using a dabber prepared, as described above, for the inking of the gelatine print, and renewing with a damp rag the moisture on the print; the inking turned out to be perfect, as well as the transfer of the print.

#### THE GUM PROCESS.

M. Geymet recommends the following method :— Place the print for twenty minutes in a damp place; then reverse the photo-transfer on a stone prepared the same as for a transfer, and run it through eight or ten times; damp the back of the print, and run it through again five or six times; carry the stone into a very dark place and make it dry quickly. After this, daub it with a dabber charged with transfer ink with plenty of turps added to it, then wash the image with a wet sponge; the ink should remain only on the parts where the gum has been rendered insoluble by the exposure to light. Wash again with the sponge well soaked in water; allow it to dry a few hours before gumming it; gum it and let the gum dry; wash and ink slightly for an ordinary transfer. If the first inking is not sufficient to bear a strong etching, proceed to ink it again a little more heavily, so that it can stand an etching of ten per cent.

This mode of manipulating, with which certain practical lithographers have obtained some pretty results, has appeared to us always to have some drawbacks, especially from the manner, more or less clear, in which the print is evolved. It may happen that certain parts of the drawing remain completely obliterated. We have obtained pretty good transfers by proceeding in the following manner :—

Take the print as above, but with one degree more of exposure to sunlight, namely, three minutes, instead of two or two and a half, in view of the sensitiveness of the gummed paper; place your print with the face downwards on a sheet of sized paper; cover it over with about thirty sheets of damp unsized paper; let it stand long enough to make it take a certain amount of moisture, to be determined by touching it; the finger must stick slightly when it touches the gummed surface. During the lapse of time required for this operation, wedge in the press a pumiced stone prepared the same as for an ordinary transfer. We would advise, however, to wash it over with turpentine, which should be allowed to evaporate; then proceed to transfer by damping the back of the print two or three times during the ten or twelve pulls required; let the paper stand about four or five minutes to decompose; take the paper away, and dry the gum deposited on the stone during the transfer by using the fan; take a good lithographic roller, scrape it well, and put on it a piece of transfer ink, the size of a pea; then roll the stone black all over; the print should come out lightly at first, and become gradually more and more marked; when all the details are seen under the ink, allow the stone to stand for two or three hours; then proceed to develop the print by wetting the stone and inking it the same as for a delicate and fine transfer. This process is derived from that of M. de la Follie, who, instead of inking with the roller, transferred to the stone a photo-transfer heavily charged with transfer ink.

*Phototypy.*—Phototypy, it seems to us, is, next to the transfer processes which we have just given, that which is most nearly connected with lithography. Different means are given to obtain good results by processes emanating from indefatigable investigators, among whom we will cite MM. Moock, Geymet, Roux,



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Printing Ink Factory  
in the World.





Albert, etc. We must, however, state that all these processes flow, so to speak, from those given by M. Poitevin.

The principal base of phototypy is always the bichromatised gelatine applied to the different supports, but especially to glass or vegetable parchment, in case the autocopyist is used as a printing press.\*

The glass plates used as supports for the gelatine should be about a quarter of an inch thick, and their surface slightly roughened, in order to give greater adhesion to the layer; after cleaning them with alcohol they are placed on a marble slab perfectly horizontal; then the following mixture is prepared:—

Gelatine .. .. .	46¼ grains.
Bichromate of ammonia .. .. .	46½ "
Rain or distilled water .. .. .	2½ pints.

Filter this liquid and spread a layer of it about the thickness of raisin paper, and dry it by the stove in the dark room; the temperature must not exceed 30°C. (86°F.)

The plate, when entirely dry, is placed, with the gelatine side downwards, on a flat board covered with a piece of black cloth or light felt, and then exposed to the light for eight to ten minutes. The part of the gelatine layer adhering is thus rendered insoluble. The black cloth having absorbed the luminous rays, the upper part of the gelatine layer preserves its properties by making it undergo a bath of water kept at the temperature of the laboratory; this bath has the property of removing the bichromate not exposed to the sunlight; the plate is then allowed to dry. This first preparation is used as an adhesive support of the layer of bichromatised gelatine, for the hardening of the side in contact with the glass renders it thoroughly adherent.

These plates are then immersed in a bath of warm water at 35°C. (95°F.) to 40°C. (104°F.), until the upper layer is sufficiently damped, when they are put to drain (or drip) with gelatine side underneath; lay them flatwise on the horizontal support (glass or metal), and pass over it the bichromatised gelatine layer, which should be warmed at the stove to the temperature of 25°C. (77°F.) to 30°C. (86°F.) Expose it to the sunlight under the negative; plunge the plate into a bath of tepid water and rinse it with cold water, which should remove the unhardened bichromate; set it up and allow to dry. These different operations are taken from the processes of Albert, Moock, and Vidal.

AN earnest editor in *The Artist Printer* recently put it thus: "The printer must be paid for his work. Printing for glory and a church fair will not enable the proprietor to liquidate his just indebtedness, buy peace for himself, bicycles for his boys, handsome gowns for his daughters, nor yet diamonds with which to win kisses from his wife."

\* The autocopyist is one of the most simple and primitive utensils for printing. It consists of a hinged frame exactly enclosing a tray of hard wood, entirely flat, upon which a second tray, also of wood, is adjusted, held by two guides. A second frame fits exactly and holds this second tray downwards, so that the support of the sheet of parchment juts out about one-fifth of an inch. A copying press is used to furnish the necessary pressure. The wooden support may be advantageously replaced by a metallic plate, thus avoiding the liability of the wood to warp under the constant humidity of the gum.

## London Lithographic Artists.



THE lithographic artists of London have formulated a scheme, which however great or small in ultimate results, cannot fail to meet with the hearty approval of all engaged in the business. The conception is signally high and projected to meet all wants. The basis is greater technical education, and it is built upon the idea that the South Kensington Art Schools have failed in their adaptation to meet the real wants of the artist who makes a commercial commodity of his artistic talent.

In the first place the London lithographic artists intend to have a studio and club room, where courses of study can be pursued. It is intended to furnish these rooms with a continuous supply of all the current literature of the world which has any bearing upon the art or processes of the trade. Such a programme is as wide as can be desired by the most sanguine member of the profession, and although at first, perhaps, the courses of art study may be limited, yet there seems to be no reason why such an institution should not become a most vital link whereby artists can be kept in touch with the developments of their art and with one another, so that the trade of the country may be kept within the realm rather than sent abroad.

The objects are manifestly most advanced, and the projection is none too soon, for business is leaving the country by thousands of pounds' worth annually, to the discredit of employers, who might assist far more than they do in improving the conditions of the trade. There are certainly a few employers of the type of Messrs. Bemrose, who look at the business from its real standpoint, and not from the narrow, jaundiced aspect of mere present commercial gain.

To work well a man must be treated well. How can an artist be expected to turn out good work if he is surrounded by whitewashed brick walls and no artistic adornments to refresh the eye? How can a man always be producing novel designs if he does not see what is being done elsewhere, or if he has no time to study design by reason of long hours or systematic overtime?

The attempt thus sketched out to improve matters by the lithographic artists themselves is extremely praiseworthy, and deserves more than the average measure of success.

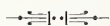
In connection with this scheme, the first public step will be an exhibition of artistic work, held simultaneously, and probably in the same building as the Workmen's Exhibition of British Industries, at the Agricultural Hall, London, in July and August.

THOMSON—See this picture of Bronson. Isn't it truly a speaking picture?

Johnson—So it is. (Growing nervous). Let's come away. It may ask us for a loan.—*Yankee Blade*.

THE highest problem of any art is to cause by appearance the illusion of a higher reality.—GOETHE.

## A New Photo-Intaglio Process.



BY LOUIS E. LEVY.



WITH the exception, perhaps, of the domain of electricity, there is no other special field wherein the recent advances of science have opened so many avenues of progress and effected such notable changes as in the range of the graphic arts. From the time when, fifty years ago, the earlier researches of Scheele and Seebeck on light-sensitive compounds were first wrought into practical shape by Niepce, Daguerre, and Talbot, the applications of photo-chemistry have increased in number and extent to such a degree that to-day the various processes of photographic reproduction would require a long catalogue to merely name them. Many of these variations, though marked, are unessential; others have proven of scientific interest only, while quite a long list of practical photo-reproductive processes have from time to time been superseded by simpler and more efficient methods.

The new photographic process which I have the pleasure of announcing is, as I trust will appear in practice, an effective and greatly simplified method of producing a photographic reproduction in the form of an intaglio engraving. Such engravings, technically known by the French term "photogravure," have been produced for some years past by a variety of photo-chemical processes, the most notable of which are those wherein the result is attained by means of a chrome-gelatine film. The fact that a film of chrome-gelatine becomes insoluble when exposed to light, and remains more or less soluble according to the degree to which light is permitted to act upon it, has been made the basis of a variety of processes for the production of photo-engravings.

The gelatine film long served as the most effective means for the production of photo-engravings in relief, and still furnishes the basis for the production of photo-engravings in intaglio. For both purposes the sensitized gelatine film is exposed under a transparent negative or positive, as may be requisite in the subsequent procedure; the unaffected portions and unreduced quantities of the exposed film are either swelled by absorption of a liquid or are dissolved and washed out, and the film then dried. In this condition it may be printed from direct, or it may be used as a mould to produce a reverse in a fusible metal; or it may be covered with an electrolytic surface to receive an electrotype deposit, or it may be moulded in plaster, wax, gutta-percha, or other suitable substance, from which, in turn, a reverse can be made by casting or electrotyping.

Intaglio photo-engravings have also been produced by a process wherein the varying amounts of reduced silver left in the developed gelatino-bromide plate are made to serve as a corrosive or etching agency on a plate of copper on which the bromide plate is imposed, but in general practice the washed-out gelatine

film has thus far proven the most practical means to the desired end. In all photo-intaglio processes hitherto known or practised, the nature of the plate produced and the end sought to be attained is akin to that which is technically known as a mezzotint or aquatint engraving. The essential feature of such engravings consists of the varying depths to which the design is sunken in the plate, the graduations of depth in the plate corresponding to the gradations of light and shade in the printed impression. The ink being rubbed into the depressions of the design and rubbed off from the surface of the plate, the highest parts of the engraving represent the highest lights of the design, the deepest depressions render the darkest shadows, and the intermediate depths produce the half-tone gradations of the picture. The difficulties attending the production of photogravure plates with the particular degree of gradation of depth which is requisite for an artistic effect in the printed impression are such that the process is practised only by a few, the skill and experience needed for the work being attained only after a long practice, and then in a full measure only by such individuals as possess artistic capacity and training.

In only one establishment, and that in Paris, has the work been brought to a high degree of quality, and there, as well as in other workshops, the hand of the skilful retoucher is frequently to be credited with the largest share in the final result.

To free this result as far as possible from the limitations of human handiwork, and to bring it forth under the more uniform and definite control of scientific procedure has been my aim in the experiments which have resulted in the present method. This method I have named "photo-mezzotint," not because that is the most exact term by which to denote it, but because all the other good names have been pre-empted and made to do service in other directions.

The essential feature of the new method lies in the fact that the picture, instead of being obtained from a graduated depth of the engraving, is produced from a sunken surface of uniform depth, the gradations of light, half-tone, and shade being effected by minute lines and stipples of varying thicknesses, but of uniform distance apart from centre to centre.

In this respect the photo-mezzotint may be regarded as a development of the so-called half-tone relief process, the true mezzotint or photogravure effect being attained by reducing the thickness of lines and stipples and multiplying their ratio to the surface to such a degree as to render them invisible to the naked eye. In that way, all the finest gradations from pure white to deep black are obtainable, with the result shown by the specimens before us. In these the picture is made up of equi-distant stipples, varying from a microscopic point up to a size where they coalesce into a solid black, the half-tones consisting of stipples of about one four-hundredth of an inch in diameter and about 44,000 to the square inch. If a coarser stipple is used, the effect varies from that of a mezzotint and approaches more nearly that of a line engraving, the lights and shades being made up of perceptible lines and stipples, like the effects of a steel or copper plate engraving of equal texture.



The processes at present in vogue for the production of photo-intaglio plates require not only long experience and a high degree of manipulative skill, but also take up quite a length of time—frequently a week or more—for their completion, and the plate, after passing the stages of the photo-chemical process, has then still to be extensively helped by the work of the retoucher. The retouching of photogravure plates inevitably introduces a degree of uncertainty as to the accuracy of the reproduction, the result as left by the retoucher being frequently very different from the original in its disposition of lights and shades. By this new process all of these undesirable factors are eliminated; its manipulations are far more facile, the length of time for the entire work is reduced to a few hours, and the result is complete without the supplementary aid of the skilful engraver, except, possibly, in cases of local blemishes or accidental defects. It is therefore reasonably to be assumed that this new method of intaglio engraving, which has been the subject of an application for letters patent, may be regarded as a desirable addition to the category of the graphic arts.—*American Bookmaker.*

### The New School of Lithography at Philadelphia.

THE COMMITTEE on the establishment of trade schools, appointed by the National Lithographers' Association to confer with the president of the Drexel Institute upon the establishment of a school of lithography, have held a further conference with Dr. MacAlister and received very gratifying assurance of Mr. Drexel's entire readiness, not only to supply the necessary capital for equipment, but to accord such space as might be needful for the accommodation of a large class of students. Changes will have to be made in the building such as will bring the first term of the school to September for an opening, and this will afford ample time in which to make the necessary arrangements. At present the chief difficulty lies in securing a teacher whose practical knowledge of lithography, in its artistic, chemical, and mechanical departments shall be supplemented by the ability and willingness to impart what he knows, and by something more than rule-of-thumb experience. The opportunity, says the *Lithographers' Journal*, is a good one for the right man, and will doubtless be seized with eagerness by those who care more for the art than for temporary gain or mere personal emolument. The salary, \$3,000 a year, is adequate to the needs of comfortable living and ample for the work to be done. The chance which such a position will afford to acquire international reputation, the superb equipment in the respective laboratories ready to the hand of the teacher for original experiment, the comparative shortness of the term and the reasonable number of hours expended in actual teaching, as well as the time offered for study, are no small incentives for the proper man.

"D—— Nature! she always puts me out," said Fuselli, whose forte was the so-called grand or romantic style.

### Carbon Printing.

CONSIDERABLE proportion of amateurs who have not seen the process worked imagine that a large number of appliances, not found in the den of the ordinary amateur, are necessary for its practice. This idea, in great measure, has been formed from the manuals of the process, in which a long list of articles, with prices of "sets," are given. Very possibly this has had the effect of retarding the progress of carbon printing amongst amateurs. As a matter of fact, the carbon can be worked with less special apparatus than any other process in photography. This subject was particularly dwelt upon at a recent demonstration before one of the societies. We remember being at a demonstration of the carbon process at the Photographic Club some time ago, when the only appliances, beyond the exposed tissue and its final support, were a squeegee and a wash-hand basin borrowed from a neighbouring bedroom. Mr. Cowan and warm water did the rest. All that is necessary in the initial stages for the amateur is a large meat dish, to be requisitioned from the scullery, and a tin or enamelled iron baking dish from the same source: the former for holding the water for mounting the exposed tissue on for its support, and for the sensitising bath, if the sensitising be done by the experimentalist, and for the alum bath; the latter for the warm water for developing. In addition to these, a squeegee is required, and, for the beginner, a thermometer is desirable. As extreme accuracy—a degree or two—is not essential, one of the cheapest form will suffice. One more item is necessary, namely, an actinometer. The one preferred by Lambert for his demonstrations consisted of a series of progressive thicknesses of thin bank post paper in a quarter-plate pressure frame, with a piece of sensitive silver paper behind, which any one can make for himself in a few minutes. Hence it will be seen that the most primitive arrangements will suffice to prove the process. That being done, the amateur can then elaborate them to suit his requirements. The progress of processes is often retarded by their exploiters introducing a number of accessories which they supply, and some think necessary, for the work. The foregoing remarks may be fittingly taken as a sequel to the article on Carbon Printing in No. 8.

MORE TESTIMONY.—Recently, a printer in Manchester had sixty reams to run off a drawing made up of stipple, splash, and chalk. Of course, he used sour beer, and gum, and dilute acid occasionally to keep it clean. These etchers gradually thinned and bared the work, and when the work was passing from the stage we know as "passable" to the state called "rotten" or "worn out," he applied the remedy we published in a recent issue. He washed the stone with clean water, polished the work off with an even stone, and left a good level face on it. Next, the work was washed over with a weak solution of alum, the stone allowed to dry, and finally gummed. The work was brought up by rubbing and rolling, and went on smoothly to the end of the order.

# Rotary Litho Machines.

SPECIALY WRITTEN . .  
FOR THE JOURNAL.



THE growing demand on the part of great advertising firms for a "tirage" verging on millions of copies is slowly but surely impressing itself on the minds of machine builders. The idea, which did not exactly originate with me, but which it was my fate to identify myself with, of supplying to litho machines the great economy of printing upon "endless web," like the newspapers of the present day, thus ensuring not only rapid output, but facilities for superimposing colours in perfect register from properly prepared colour stones, involves the rotary principle. This can be carried out in two ways—the cylinder must consist either of, firstly, rings of stone upon a central mandrill as axis; or, secondly, of a turned cylinder round which are bent zinc plates, much in the same way as stereotypes and electrotypes are curved to produce a "form" for a printing cylinder in contradistinction to the ordinary flat.

Some forty years ago I succeeded in making a cylinder of litho stone composed of what I may term washers, four inches thick, having a two-inch mandrill or axis through their centre, of about twelve inches circumference outside. These rollers were designed to print *paperhangings* instead of having recourse to "cut" wooden rollers. My better genius intervened to prevent my patenting this invention, or possibly in those early days I might have been a ruined man, either intoxicated by sudden success, or more likely still, by my coming long before my time. If you want to turn "litho" stone in a lathe you must set your tool at least one-tenth of a diameter below its axis, or even more, and the edge of the tool should be ground to an angle of 60°. Hard as it is, litho stone will then cut like cheese. In boring the hole or core to fit the turned mandrill, the tool should be ground to the form of a saw-file, but its base should be the base line of the square out of which the equilateral triangle can best be got in section. Thus, odds and ends of thin stones, fractured pieces, and good portions of otherwise bad stones, may be utilised. The shaft of the cylinder should be provided at one end with a square shoulder, and at the other with a screwed end and fitting nuts to tighten up the joints of the stone washers (the second nut coming in merely as a lock-nut). On this cylindrical stone "form" any transfer could be put down, or in case of colour jobs, off-sets could be laid, and the "chalkist" or the "stippler" make his colour stone. The clearing off of one job and the turning up of a dozen rollers to the hundredth part of an inch is merely the work of a journeyman turner, and the after addition of a grain, by means of an easily devised "rest," to suit the particular job, which might safely be left to the artist himself to specify. I have only to refer to a cognate industry, the French polishing trade, to prove that the rotary method of preparing stones for litho work would be an economy on any known method of getting up flat

surfaces. The lathe is a tool much more easily controlled than the ordinary surface-planing arrangements of the so-called grinding and graining machines of to-day, the slide rest being, *per se*, the truest and most effectual method of attaining absolute truth of surface, with, at the same time, the least possible expenditure of minute care on the part of the workman. Wearied of taking out patents for my inventions, I now freely give my ideas to the printing trades (and this cylinder is not my first gift to the printing world).

To insure register it is only necessary to rule a line for grip—the rest must follow of itself. But there is always the alternative of drawing either in "chalk" or "stipple" the eight, ten, or twelve colour stones on the flat, and transferring them to plates of zinc which can be tightly drawn around a cast iron cylinder truly turned, and there firmly held until the job is done. This, in the language of the Jew clothier, ought "to fit you like de paper on de wall." Its original conception was to produce much more highly artistic paperhangings than those produced by the older processes, and, at the same time, by employing the "rotary principle," to bring wall posters within the reach of hundreds of thousands of tradesmen who are now debarred from "bold advertisement" by their abnormal cost.—J. W. HARLAND.

OUR numerous readers who dabble with chemicals may be reminded that the Registrar-General's report for 1892 shows that certain photographic chemicals were responsible for deaths as follows:—

Chemical.	Accidents.	Suicides.
Acetic acid . . . . .	—	1
Ammonia . . . . .	2	5
Bichromate of potash . . . . .	1	1
Caustic soda . . . . .	1	1
Copper sulphate . . . . .	—	1
Cyanide of potassium . . . . .	2	13
Hydrochloric acid . . . . .	7	17
Mercury perchloride . . . . .	1	—
Nitric acid . . . . .	5	3
Oxalic acid . . . . .	2	20
Sulphuric acid . . . . .	5	8

This list is sufficiently comprehensive to warn our readers that many of the chemicals in common use in our dark rooms may, if imbibed, lead to trouble, if not to coroners' inquests.

PERHAPS in no respect does the artist reveal himself so much as in his capacity for self-abnegation, in suppressing or even destroying those productions which, although in some one respect or in some limited manner satisfactory and pleasing to himself, are not wholly good and worthy of exhibition. In some respects it is very true that the artist should work for himself alone, caring nothing what his critics may say. Very true, and ever to be borne in mind; yet there is danger in putting forward as an artistic work for the acceptance of all those productions, be they paintings, or photographs, or what else may be accepted as art work, which merely portray or express in some respect the particular fancy or foible of the author, but in other ways are faulty and imperfect.—*Amateur Photographer*.

ART must anchor in nature, or it is the sport of every breath of folly.—HAZLITT.









# Improvement in Zinco Printing.

STRAINING DEVICE FOR ADJUSTING THE PLATE.



FIG. 1 is a side view of the clamping-jaws with plate secured between the same. FIG. 2 is a rear view of the same. FIGS. 3 and 4 show parts of clamp separated. FIG. 5 shows the straining device. FIG. 6 shows the several parts assembled. FIG. 7 is a rear view of the same. FIG. 8 is a rear view of part of mechanism.

The object of the invention, which has been recently patented in the United States, is to produce a straining device by which the plate may be more easily and readily adjusted to its bed; and it consists in the construction, arrangement, and operation of separable mechanism for that purpose.

The devices now in use for straining plates to their beds are attached to and form a part of the bed and its supporting sides. This attachment necessitates the securing and releasing of the plate from the holding-jaws every time it is used. As the same plate may be frequently required, the time and labour expended in fastening and unfastening the clamps is considerable, and seriously interferes with the rapidity of the work. To overcome these difficulties the inventor separates the parts of his device into two divisions, one of which is fastened to and goes with the plate, while the other is attached to and forms a part of the bed, the two divisions being easily and quickly united to operate together in straining the plate.

The clamps are constructed in two parts, A and B, figs. 1, 2, 3 and 4, and are fastened to the opposite edges of the plate at equal distances from each other by means of a screw-bolt F. The co-operation of the parts A and B is more fully insured by an extension D of the jaw A, which fits into a recess E of the jaw B (see fig. 3). This operation of attaching the clamps to the plate may be performed before the latter is placed upon the bed, and they may remain upon and be removed with the plate when it is taken off.

G, fig. 5, is the bed, and H the straining-lever hinged thereto, and having a hook J at the upper end.

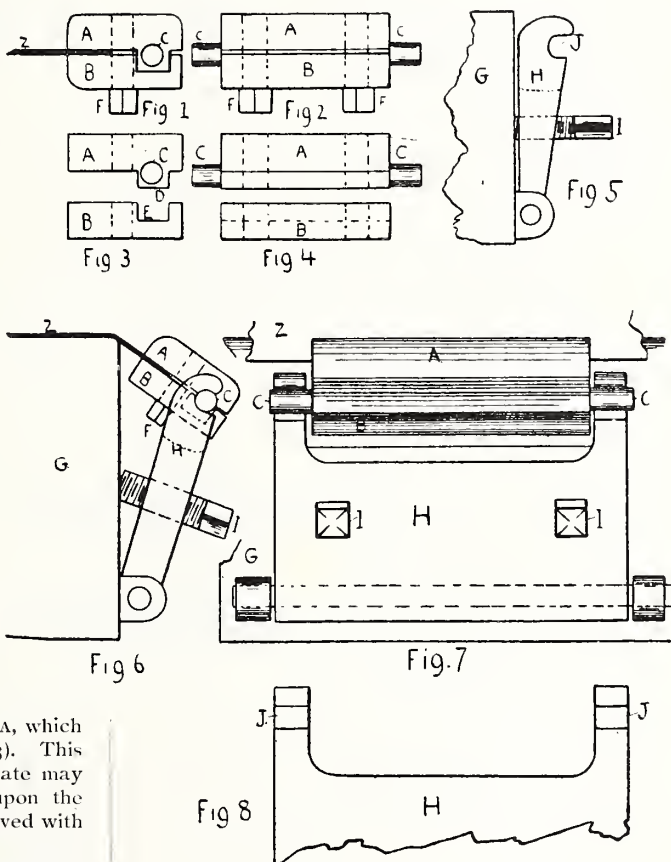
I is a straining-screw working through the lever H, and forcing the latter off by means of contact with the supporting side of the bed G.

C C are trunnions upon either side of the clamps, and Z is the zinc plate.

The operation of the device is as follows:—The clamps having been once attached to the plate, as shown in figs. 1 and 2, and the straining-lever being in the position indicated in fig 5, the plate is placed upon the bed and the trunnions c c placed within the

hooks J. The lever H is next forced off by turning the screw I, as shown in fig. 6, in a manner already understood, which brings the plate into close and complete contact with the bed, more or less strain being exerted on the screws as may be required to make the plate smooth. Whenever any particular plate is done with, the screw I is turned back, bringing the lever H to a nearly vertical position, when the trunnions C C may be disconnected from the hooks J, and the plate, with its clamps, may be removed and laid away for future use. By means of the trunnions C C, working in the hooks J, the direction of strain is always coincident with the angle of the plate.

—*Lithographers' Journal.*



A SHEET CALENDAR, 13 × 11-inches, from the Tokyo Tsukiji Typefoundry, Tokyo, Japan, is so decidedly Japanesque in design and treatment that an imprint is scarcely needed. The whole design, illustrating musical instruments and stage accessories, is in several colours and gold, forming a capital musical or theatrical emblem. Our education as regards the Japanese language has been neglected, so that we forbear any notice or descriptive matter, and merely say that we much appreciate the good taste which has resulted in such an artistic production.

## Aluminum in Lithography.

**S**OME time since we offered details of a newly patented process of surface-printing in which aluminum furnished the basis of departure. The following is a modification by the same inventors:—The invention relates to surface-printing plates having a surface of pure or substantially pure aluminum, as claimed in patent No. 459,239, dated September 8th, 1891.

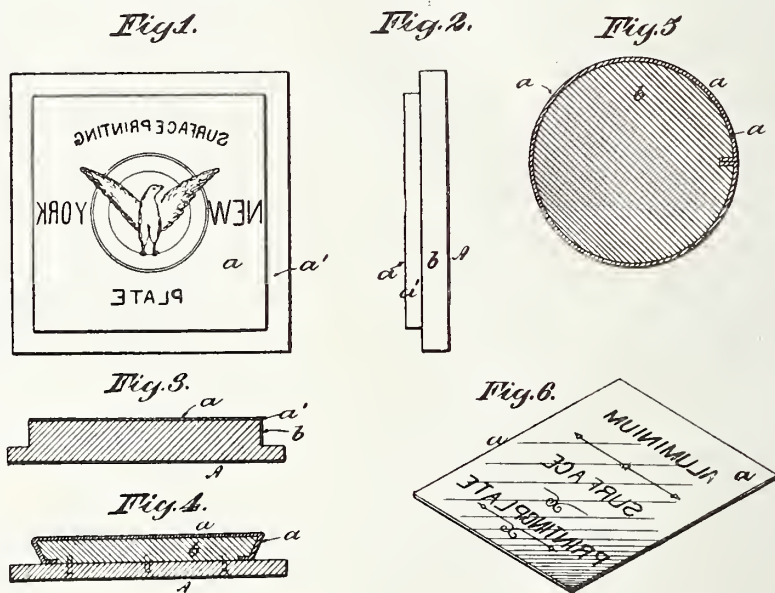
An important discovery which the inventors claim to have made, and one which distinguishes clearly the difference between their use of the aluminum plate and the use of the stone, is that they are enabled to regulate the density of the plate, and consequently its porosity, during its manufacture, with relation to the work to be performed on it. Thus a finer grade of work can be produced on a plate of comparatively greater density than that desirable for work of a coarser nature, and this feature of variable density, in a measure, may be considered independently of that of the preparation of the surface by graining. It is true that both the density of the plate and the coarseness or fineness of the graining imparted to the surface act in conjunction in affecting the quality or grade of the plates; but the variation in density is of paramount importance in regulating the actual degree of porosity upon which the absorbent quality of the plate mainly depends.

The invention consists, essentially, in adapting the absorbent quality or porosity of aluminum surface-printing plates to the special character and requirements of the designs to be imposed thereon by regulating the density of the plates. This is accomplished by compressing the aluminum plate or surface, more or less, by mechanical means, as by rolling, etc. The comparatively light spongy nature of the metal readily admits of this treatment, and the closeness or texture of the plate and printing surface can be thus varied or regulated with uniformity and precision.

Fig. 1 is a plan of a flat printing plate with aluminum printing surface, upon which a design has been imposed; fig. 2, an edge view of fig. 1; fig. 3, a sectional view indicating a plate of metal or other suitable material provided with a facing of aluminum deposited by electrolysis, the thickness of the aluminum being exaggerated for purpose of illustration; fig. 4, a similar view showing a sheet of aluminum backed with metal or other suitable material; fig. 5, a sectional view of a cylindrical printing-roller formed with a printing surface of aluminum. Fig. 6 is an

isometrical view of a comparatively thin sheet or printing plate of aluminum, unsupported by any backing, and, therefore, sufficiently flexible to adapt itself readily to pressure during printing.

The printing plate *a*, as a whole, may be formed or built up in any suitable or well-known manner, provided it is formed with the facing *a* of aluminum. Thus the facing *a* may be afforded by the use of a comparatively thick plate *d* of aluminum attached to a platen or base *b*, or a comparatively thin layer *d*, fig. 3, of aluminum may be applied to the base or platen *b* by electro-deposition. Again a thin plate of aluminum may be secured to the base or platen *b* by any suitable mechanical means of attachment, as illustrated in fig. 4, or to the surface of a rotary printing-roller *b* (indicated in fig. 5), or a simple thin sheet of the metal may be used for the printing plate,



which form is especially effective in some forms of printing—as, for instance, for use in the hand-press.

In all the constructions indicated, as well as in the case of others in which it may be desirable to comply with the requirements of special use, the essential feature is the layer or plate *d* of aluminum, affording a printing surface *a* of that metal, and all questions of construction and application are secondary to that.

The density of the sheet or plate *d* of aluminum, or in which aluminum predominates, is regulated mechanically by compression, as by rolling, hammering, etc., or by burnishing the surface to decrease its porosity.

It is to be understood that, while they use and claim substantially pure aluminum for the improved surface-printing process, they do not limit themselves to the pure article, as any compound plate in which aluminum predominates may be used, if desirable, without departing from the essential spirit of the invention.—*Lithographers' Journal*.



## Printing on Celluloid, etc.



AMONG recently patented inventions, says a writer in the *British and Colonial Printer and Stationer*, is a process for printing in ink on celluloid, horn, ivory, or other similar materials. Heretofore it has been found

impossible to print cleanly, perfectly, and in a permanent manner with fatty printing inks on celluloid or other similar materials. The fatty body of the ink has been unable to penetrate these impermeable substances, especially celluloid, the elements composing which tend to prevent the fatty body of the ink from drying. Moreover, in lithographic or typographic printing, by the pressure on the inelastic surface of the celluloid, the fatty ink covering the stone or the type is bruised and caused to spread in printing, and thus it is most difficult to obtain on these materials proofs as clear or clean as those obtainable by printing on paper.

The present invention aims to obviate these difficulties, and to provide means whereby printing may be done with fatty ink on celluloid, horn, ivory, and similar substances with the same perfection and rapidity as lithographic or typographic printing is now done on paper. The surface of the celluloid, horn, ivory, or other similar material to be operated upon is prepared in such manner that it will receive the impression with some degree of elasticity, and will absorb a portion of the ink. Preferably this is accomplished by producing on the surface to receive the impression a very fine grain or a multitude of minute pores, then washing this grained or porous surface to free it from any foreign substance, or any substance obstructing the pores, then treating it with a varnish adapted to penetrate the pores, then with an impalpable powder, and subsequently treating the surface so treated to a calendering or other operation, in order to give it a polished or satin finish, whereupon the surface is adapted to receive an impression according to any ordinary method of printing. The name which has been adopted for the process is "cellulochrome."

The details of the process are thus described:—On the plain, smooth, and polished surface of the celluloid, horn, ivory, or other similar material there is produced, by employing a jet of sand, an excessively fine and very tight grain or a multitude of minute pores. If desired, certain portions of the surface may be kept free from this grained or porous condition by protecting them from this treatment. After producing the grained or porous condition, the surface of the sheet is washed with water or with alcohol or other suitable liquid, in order to clear the pores or grains formed on the surface from all foreign matter, or matter which may fill or obstruct them. The surface of the grained sheet is next covered with a suitable varnish, preferably using a varnish made of two parts of fat varnish, one part of white copal varnish, and one part of rectified essence of turpentine, lavender,

aspic, or other equivalent agent. By wiping or otherwise manipulating this varnish as it covers the sheet, it is caused to penetrate into the pores or grains produced on the surface thereof, thereby clearing the surface.

The sheet thus prepared is then covered with an impalpable powder made of equal quantities of sulphate of magnesia and sulphate of baryta, which is left on the sheet for a few hours, after which it is thoroughly wiped off, whereupon the surface of the sheet is calendered or given a satin finish in any known manner. The surface of the sheet, in the infinity of small, almost invisible pores thereof, is thus given a very thin coating of nearly diaphanous matter enclosed and secured in the pores, and having a great affinity for the fatty body of the ink, which it will absorb and retain with the same adhesion and with the same elasticity as would a sheet of paper. On this surface the finest and most delicate lines and tints may be printed without causing any bruising of the ink or any spreading. The impression printed on this surface will be permanent and durable, since the fatty substances in the ink will have been absorbed by the coating and cannot be rubbed off, while the unprinted portion of the surface will have its ordinary appearance. If desired, a colouring matter or a metallic powder may be incorporated into the impalpable powder before the latter is applied to the surface, in which case indelible tints will be imparted to the latter, which cannot be destroyed by friction.

## Damp Transfer Paper.



THE question of having transfer paper which is always sufficiently moist to use immediately is not by any means a new one. Such papers are manufactured in this country, and there are some few printers who know the art of making them. But to the majority it is enshrouded in mystery, and it is with the desire to clear the mists away that the following details are given as a basis from which experimenters may arrive at the proper article.

From experiments now in very favourable progress it appears that the materials being tried for the composition of the transfer paper are simply: isinglass, sal ammoniac (ammonium chloride), and glycerine. The formula seems a very scanty one, but practice proves so far that it is sufficient. The principal object that the experimenters have in view at the present time is the preservation of transfers on paper, instead of keeping originals on stone. They have therefore coupled with making of a paper the preparation of an ink which shall give material assistance in the same direction. The ink is a strong, hard transfer ink, containing beeswax, Burgundy pitch, and stearine. As yet, the experimenters do not feel sufficiently confident to give the precise formula for either the paper or the ink; but as they prove their ground it may be expected they will also publish the quantities for the benefit of many who are striving in the same direction to improve the trade and insure it against competition.

## High Relief Clichés in Half-Tone.



GRAPHIC reproductions have never been as popular or brought forward in such enormous numbers as at the present time. Indeed, the world abounds in pictures. Events occurring on the public streets to-day are depicted in

the newspapers of to-morrow published in tens of thousands of copies; and when new works of art enjoy public recognition they are speedily reproduced by a variety of methods of reproduction.

New methods of intaglio printing from photographic negatives are of but little general interest; the high relief plate, printable upon the ordinary type press, is much more so, because we do not only want to print, but we want to print rapidly. Before it was understood how to etch in relief a photograph with all its lighter or darker tone gradation, whether on zinc or copper, a very long time had necessarily to elapse, and before a plate could be prepared for the press the original photograph had to be first reduced into line or stipple. The first attempts to break up the continuous half-tones of the photograph were made by drawing very fine lines upon the asphaltum picture film resting on the metallic plate, by means of a sharp diamond point and the ruling machine.

Much better results were obtained by interposing between negative and sensitive plate a stripped collodion or gelatine pellicle, the carrier of an extremely fine system of crossed lines; but as this method did not give entirely satisfactory results, lines were drawn on a large scale on a sheet of paper, reduced photographically, and the negative thus obtained brought in immediate contact with the sensitive film. For full-toned pictures the results were quite satisfactory, but outrunners into the higher lights were impossible to produce by the process.

The most important innovations upon this very wide and promising field were brought forward in 1883 by Meisenbach, who interposed lined plates between diapositive reproductions of the original negative and the sensitive film, copied from them a printable negative, and finally transferred them to the zinc plate preparatory to etching. The most essential feature of the process is that the exposure is interrupted when producing crossed lines.

The Artistic Photographic Institute of Angerer and Göschl, of Vienna, has improved Meisenbach's process very much, for they copy from the original a crossed line negative by one single exposure. Highly interesting experiments have been made with this method under my direction in the Military Geographical Institute, by E. Mariot, then superintendent of the photographic division. They have shown that a good grained plate (Kornplatte), for dissecting the continuous turn of the matrix, is found in the Pucker grain (Runzelkorn) of an exposed lichtdruck plate; it being, however, extremely difficult to prepare on a large scale perfectly uniform grain plates of this description, small portions of the most possible

uniformity were enlarged six or eight times their original size, transferred upon lithographic stone, retouched with ink and graver, and as many transfer prints made from it on a large stone as to secure an original plate of dimensions suitable for any kind of reproduction. This seems to be a rather tedious procedure at first glance, but when it is considered the operations are to be done once only to obtain a plate serviceable for all occasions, its utility becomes certainly apparent. If the black and the white particles of such grain plates are of equal value, it is immaterial whether a negative or a positive copy of them is brought into use; but when uniformity does not exist, the most intense parts of the grain should also be the smallest, else the fine details in tone gradation would suffer almost total disintegration.

The application of the grained plate may be described as follows:—

A photographic copy of it is stripped from the glass support with collodion or gelatine, the film laid between negative and chrome gelatine paper, or albumenized paper made sensitive with bichromate of potassium, and exposed. The exposure must be continued until the grain has totally disappeared in the deepest depths, or respectively becomes visible in the highest lights. Negatives of but moderate density, not excessively opaque in the highest lights, are most adaptable for the method. Harsh matrices of abrupt contrasts and glassy shadows must first be softened, which is best done by applying to their reverse side a light sensitive coating, chrome gelatine for example, exposed in direct light, excluding all light falling laterally upon it, and final fixing or washing out. The exposure should naturally be but moderate, a slight tone in the glassy portions of the matrix visible after development would result in a monotonous cliché. After exposure the plate is inked and washed out. Applying the ink with a roller gives generally better results than by tamponing. At last the picture is transferred upon zinc or copper. Should the lights be too intense, retouch with the needle; the depths strengthen with the brush. Etching is done in the usual manner.

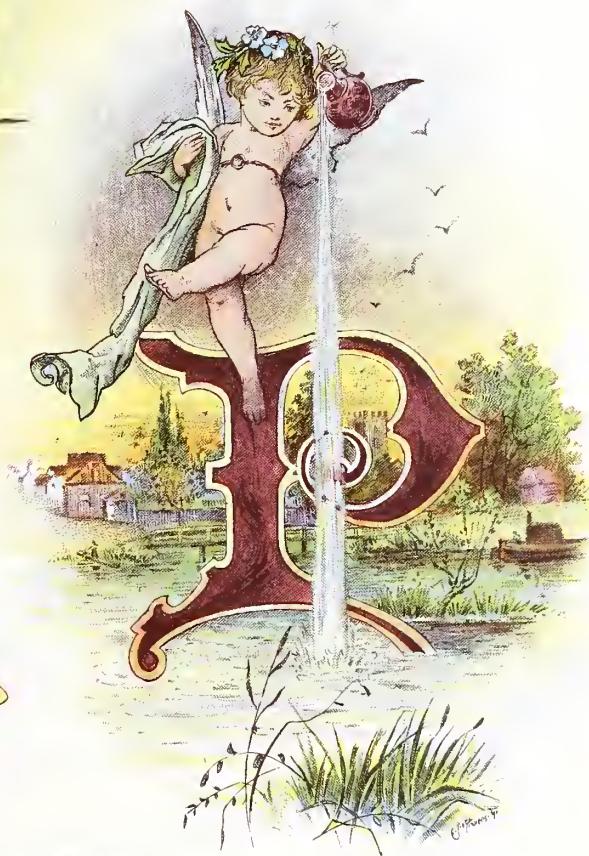
Another method of utilising the grained plate is to reproduce it photographically upon a glass plate; and to varnish, to place it in absolute contact with the negative and expose chrome-gelatine paper under the diapositive thus obtained, roll in with ink and develop. After making a transfer, the drawing to be etched in relief stands out clear and sharp, when the plate is slightly heated and flowed with a solution of shellac of the following proportions:—

7	parts (by weight) of	.. ..	brown shellac
160	"	.. ..	alcohol
40	"	.. ..	sulphuric ether

and of fuchsin enough to give the solution a decided dark colour.

When dry, the plate must be moistened freely with spirits of turpentine, or bathed in the same for a quarter or half an hour, and touched up with a flannel rag. The transfer print is dissolved by the operation, but the shellac, still resting upon the lustrous metallic surface, allows the drawing to retain its original sharpness and definition. It is ready for etching.





Printed on Grosvenor, Chiswick, London, Printing Paper

De Montfort Press Ltd.







Whoever is well acquainted with galvanoplastic work may copperplate the clear and sharp image without resorting to the shellac varnish, and then go at once to etching with very much diluted nitric acid—an operation carried on with remarkably fine results in the Imperial Military Geographical Institution.

I will yet mention a newly-devised method of producing grained plates, that of Herr Bartock, with sandblasts, practised now in the imperial court and state printery of Austria. A very finely polished zinc plate is covered with a thin stratum of varnish, consisting of:—

200 parts (by weight) of	.. .. .	chloroform
5 .. .. .	.. .. .	mastic
10 .. .. .	.. .. .	asphaltum
300 .. .. .	.. .. .	benzine
2 .. .. .	.. .. .	petroleum

A half-tone photographic pigment picture is flowed with the varnish after being transferred to the plate, and bathed in a mixture of:—

35 parts (by weight) of	.. .. .	glycerine
25 .. .. .	.. .. .	water
2 .. .. .	.. .. .	alum

where it remains for about five minutes; the plate is then taken up and the solution blotted off with bibulous paper. The pigment has now the property of being easily destroyed, and when in that condition may be subjected to the action of a moderately strong sandblast. By centrifugal force of the sand the soft and feeble relief picture is gradually and step by step destroyed, and the varnish film beneath similarly attacked. When the photographic film is totally gone the image appears in all possible details and grained upon the varnish stratum, and may at once be etched with weak nitric acid. After about two minutes' etching the acid is washed away and the plate brushed over with a solution of gum arabic in the proportion of 1:5. When dry, the varnish film is removed with a turpentine-moistened tuft of cotton, rolled in with ink, moistened, and any superfluous colour taken off, when the picture stands out clearly and sharply upon the zinc plate, ready for the printing press.—*OTTOMAR VOLKMER in the American Annual of Photography.*

**PHOTO-LITHO NEGATIVES.**—To succeed in photolithography, or any of the other photo-mechanical processes, it is absolutely necessary to have a perfect negative to start with. A perfect negative means one in which the details are accurate, and in which the lights are opaque and the shadows or lines are clear glass. To obtain this result, a method of intensifying gelatine emulsion negatives, applicable more to photo-mechanical methods of printing than to chemical silver printing, is given in *Photo Archiv*. In one quart of water is dissolved fifteen grains of iodine and thirty grains of iodide of potassium, and the negative immersed in the solution until the plate turns perfectly yellow. The picture dark yellow upon a light yellow ground. After careful washing, till the drippings are free from colour, one per cent. solution of Schlippe's salt-made alkaline with a trifle of caustic soda is poured over, and the plate is washed again. The deposit is of a dark reddish brown colour, and the non-exposed portions are absolutely clear.

## The Gilded Frame.



THE gilded frame serves two purposes, first as a relief to the picture, and second as an artistic piece of work itself; but it is a well-known fact that most gilded frames weaken the effect of the picture. In what relation, then, does the frame stand to the picture? Those relations are two, and they are closely connected. The first one is that the frame separates the picture from its surroundings and isolates it. The painter wants us to look into his picture, and the isolation from other objects by means of the frame makes it easy for us to do this.

The frame forms, so to speak, a window, from which we look into the world which the artist has thrown on the canvas. The heavier the frame is, the better it will produce this effect, and the gilded frame will serve for this purpose. But the frame has to fill a second purpose. It is a physiological impossibility that a picture should have the same amount of light as the object or scenery it represents. Neither a picture of day nor night scenery could do this, and there are only a few exceptions to this rule. We do not mean to say that the light should be thrown on them, but that the light should be in them, shining, so to speak, out of their own power, so that they will appear as much like nature as possible.

How is it, then, that we can see—except in our imagination—the light of the stage for the clear light of the day? From the same reason as in the evening, when the streets and the house walls are dark, we can look deeper from the outside into a lighted room than in the day time. With a dark surrounding, everything else appears lighter. The picture also should have more light. It should shine more, and therefore a dark frame should be taken for it. But people will have a gilded frame. The glittering metal surrounds the less bright picture, and instead of a lightening effect there is produced an opposite one. The pupils of the eye are drawn together where they should expand. The eye is blinded where it should be soothed. Where the pictures only serve as decorations and have no artistic value of their own, there the gilded frame will do little harm, but will serve well. But where the picture has an artistic, intrinsic value, there the gilded frame will do no great honour to the piece of art, if there are not exceptional circumstances which warrant such a frame. A person, to see this, has only to compare pictures both in gilded and in other frames in our art galleries.

It cannot be denied, however, that the gilded frame, when used judiciously in an artistic way, will at times produce a fine effect. This especially holds good in a room where there are a great many pictures. Where the gilded frame is in the right place and is used with good taste, it will serve by its enlivening glitter to brighten the effect of the whole apartment, but it must not be allowed to crush the other decorations with its conspicuous presence. Care and good taste are, then, the main things when we have to select picture frames, for beauty and affectations are two different things.—*Painting and Decoration.*



## "The Printing Arts"

**L**s the title of a handy little volume of 174 pages, published by Ward, Lock, Bowden & Co., in the latter part of last year. In this work, the author, J. W. Harland, has in reality briefly surveyed the printing arts, not with any pretension to make the work a textbook, but to give himself the opportunity of reviewing the business from a commercial and practical point of view.

Some years ago, the publishing of the "Grammar of Lithography" made public to small printers the ways and means at their disposal, and, to a certain extent, shewed them how to avail themselves of the opportunities, and how to avoid having work spoiled by the ignorance or wilfulness of bad-intentioned employees. That work, although considerably out of date, is to a certain extent reflected in the above new addition to the literature of printing. The reflection, however, is stronger than the original, and lays down maxims for employers and employees with no uncertainty.

In opening the work, the author takes up the arrangement which leads to the most economical results for the disposition of the furniture, accessories, and departments for each branch of printing; and on this point writes:—

"No absolute rule can, of course, be laid down which will meet the requirements of every office, because the exigencies of one business are not those of another; but, if ordinary intelligent forethought be exercised, and the plan be followed of placing everything so as to avoid as much as possible having to run hither and thither, the gain of time in a month or year will amount to something considerable; one additional footstep, oft repeated day by day, will, in time, represent, in a large office, the weekly wages of several men."

In referring to the best position for the overseer's desk, he says, with more truth than pleasantness:—

"If, for the sake of being central, or with the object of having a commanding view of the whole composing room, it is placed far from the entrance, it must be evident that a disturbing element is introduced by the passing to and fro of persons who ought not to be permitted to pass beyond the desk, to the inconvenience of the men at work, thus causing confusion and loss of time."

In continuing his special references to management, he narrates his own experience in French firms in the following words, upon a point in which so many different customs are now in force:—

"In France the writer found that a great saving in ink and colour for large posters was effected by giving out to the 'conductors' of machines (as they are there called) a fair amount for each job, and offering a commission on all that was brought back, a watch

being kept, of course, upon the copies printed to see that they were properly covered. The cans returned were well looked after, so as to prevent 'skinning,' and with clean water poured on were put away on shelves, labelled, till again required, the weight having been taken and the amount used properly entered in the cost-book to the debit of the job, thus forming some guide for future estimating."

Such an arrangement has long been the practice with respect to the driving of locomotives, the commission being given for saving of coal. Therefore, if it holds good, as we are aware it does in one industry, it should hold good wherever it can be faithfully and honestly applied.

Touching upon the accommodation for lithography, he says:—

"The guiding principle should be the same as that laid down for the letterpress department, namely, to contrive that every job shall pass over as short a journey in its progress from one stage to another as possible; and as the weights to be moved are much greater in proportion as compared with letterpress, and therefore slower in transit, it becomes evident that attention to this principle is in this case of even more importance than in the other."

He concludes that remark with:—

"The relative positions of the artists' room and the hand-press room should be side by side, and as near the stone-polishing room as possible."

His references to the position and fittings of the artists' room will be highly appreciated by those who spend, practically, their whole existences in such rooms. He lays down that:—

"The essentials of the artists' room are, firstly, a good *north* light, an equable, healthy atmosphere, freedom from currents of air, absolute cleanliness and comfort, and last, but not least, it should be so situated as to be unaffected by either the noise or the vibration caused by the machines at work."

For the better conveyance of stones, he describes a trolley or "turtle carriage" which should commend itself to the reasonable employer. This description is but one of a number of ingenious suggestions detailed by the author whereby the appliances of the business can be improved, and the modes of working made more economical.

Leaving for a while the physical arrangements of the establishment, he turns boldly upon the mental abilities of the managing minds, and commences his onslaught upon competition in these words:—

"Undercutting, whether arrived at by sacrifices on the part of the traveller, or using inferior material, or by lowering wages or piece-work prices, is false political economy, and must result, in the long run, in reduction of profits. Hence two unsound maxims, which are often quoted to soothe a master's commercial conscience, ought to be expunged for ever from the printing trade, viz., 'Half a loaf is better than no bread,' and 'Set a sprat to catch a salmon.' The former means too often that, not only a half, but a third, a fourth, a tenth, or even a crumb, is better than nothing; but where is this to end? Again, whilst it is true in the abstract, so far as it goes, it necessitates the completing question, 'But at what price?' No



bread for which one does not have to pay is better than a crumb that one pays too dearly for. The latter means that a job is taken at a price that entails a loss in order to obtain at some future time a job that will pay well enough in itself to cover the loss on the first, and leave a profit on the second. This is unsound, because the salmon may never be hooked, and then the loss remains a dead loss; and further, because it is sure to be quoted as a basis upon which to compute the value of future work, not only to the firm immediately concerned, but also to competitors; and thus this system opens the door to a general reduction of prices all round.

Then he falls heavily upon the system of submitting sketches, and thus expresses his views:—

“There are several unfair customs which have crept into the printing trade that are directly traceable to the natural eagerness of travellers to do business. One of these customs, which has become quite general, is the pernicious one of submitting sketches, free of charge, to the customer, on the understanding, that if he gives the order the sketch will be included at the price estimated, but, if not ordered, no charge will be made. The result is this, that the traveller, being anxious to get an order, promises a sketch, very often when there is but a hazy prospect of business; then, the more uncertain he feels about getting the order, the more wishful he becomes of having a first-rate sketch, relying on the effect of submitting something that will ‘fetch’ the order. Besides, he knows well enough that other travellers are almost sure to drop in and get wind of it, who will also offer to submit a sketch on the same terms, and this makes him doubly anxious to submit the best: hence time, money, and talent are all thrown into the balance at the expense of the firm, who are actually committed, without any choice in the matter, to ‘set a sprat’ to catch very often, not a salmon at all, but a fish of very questionable value. There is, we are afraid, no remedy for this state of things now; the travellers (the middlemen of the political economists) have created a system to which nothing can put a stop short of an agreement among all the printing houses not to submit sketches without receiving payment for same.”

On the question of motive power, a comparison is drawn between gas and steam engines: the final opinion being that in the long run the steam engine gives the most even and economical results, unless where a gas engine is not continually in use, but is simply brought into requisition at intervals. The writer discusses the amount of fuel consumed, and strongly advises employers to obtain and use a cylinder indicator, by which they can, with very little practice, soon determine if they are obtaining the full working power from their engines.

Next, the author takes up the question of tools, and makes the trite remark that:—

“The expense incurred, whilst really debited to loss, ought to be carried to account as profit, seeing that any attempt to work with tools unfit to use means a waste of at least 75 per cent. of a man's time. No one who is not a thoroughly practical workman can adequately estimate the loss of time that bad or badly used tools entail.”

He strongly condemns the want of knowledge of how to use tools, and considers that it should be a part of board school education to teach the use of the common carpenter's tools, an opinion in which we strongly concur.

Again, he attacks the Englishman who prefers the “surface-polished” foreign tools instead of the solid English goods which require “making ready for use.” The hints given in this chapter on tools will not be lost sight of by those who have eyes to see and brains to understand.

Having disposed of the business and its accessories, the writer next turns his attention to the main theme of his work, which is apparently twofold. First to express his many feasible ideas on the condition of the business as a commercial venture, coupled with the want of more technical and practical education, to keep the business up to a standard of equality with the keen foreign competitors. Mark how he rates down the average pressman:—

“An engraver *must* know more of the artistic rendering of a proof than any pressman can do without an engraver's education. Immense good would result if some course of technical instruction under a competent wood engraver could be initiated for pressmen in making ready. It is most important that they should, as a body, know more than they do now of the artistic theory, which is almost an instinct with the engraver, part of whose education is to render an artist's work under the artist's own instruction and supervision. How often, alas! do we find much of an engraver's most thoughtful work not apparent in the printed copies? This is very disheartening to the engraver, is discredit to the printing house, and unsatisfactory to the pressman, who has done his best according to his lights. No one will for a moment doubt that there are pressmen who can and do render justice to any block in their making-ready; but, on the other hand, no one can deny that they are the exceptions, not the rule; that they are the small minority—not to be met with every day. It follows, therefore, that men who can so well perform this important work can command a higher rate of remuneration. A great stumbling block is, that a pressman too often fancies that he is demeaning himself to ask for or accept hints on this subject, and thinks he ought to resent as interference or impertinence kindly meant counsel offered by those who really do know.”

He follows on with a comparison of the English and Continental printer, which has become apparent to most thinking minds, with respect to colour. Thus reads his expression of opinion:—

“Whilst on this subject, it is difficult to refrain from allusion to another weak point, attributable to the pressmen, as a body, of to-day. No one who has come in contact with the workmen of other countries can be blind to the fact that, in matching any particular shade of colour, our own countrymen are put in the background by their foreign *confrères*, and do not seem to know the fact. A very rudimentary course of lectures on colours—on producing the varied tints required in the everyday routine of artistic printing necessary to satisfy an ever-increasing fastidiousness

of a more educated public taste—would rapidly change this regrettable state of things.”

The writer having thus set his mark upon the absence of technical and artistic education, then deals with the artist-designer, and condemns most strongly the practice of taking in school of art designers who are void of all knowledge of the business, and who learn the business at the expense of employers and customers alike, whilst the trouble they give to the printers should alone be sufficient to discard them. Finishing up his remarks on the artists' department with a few good methods of rapidly obtaining enlargements or reductions.

In this manner the author has consumed about one-third of his book, when he opens out upon the second part of the theme of his work, viz., “The Theory and Practice of Line.” So strongly does the author express his feelings on this point, that if it were for these remarks alone the book should have numerous readers, who cannot fail to enter into the spirit of the theme and “make it an ideal in the mind.” He relies so much upon line that he says:—

“Line is capable of expressing the perspective of all surfaces, and of producing on paper the effect of atmosphere, often called *chiaroscuro*, or aerial perspective.”

He then bewails the probability of line-engraving dying out, in saying that:—

“It has been affirmed that, in this latter half of our century, the ‘historical engraver’ has almost ceased to exist. Photographic and photo-engraved copies have cheaply reproduced the work of our eminent painters, instead of the translation from colour to black and white being intrusted to men whose whole life-study has been to learn how to render in line the subtle and beautiful poesy of pictures. It has been said that the art of line-engraving is fast dying out, and that soon it will become impossible for the Academy to find applicants for their future vacancies in engravers' associateships.”

This reference to photography is well supported by subsequent passages which are sufficiently expressive to deserve recounting:—

“No one who has attentively noted the gradually increasing correctness observable in drawings and engravings since the discovery of photography, can help acknowledging how the influence of this scientific art has educated the eyes of the masses as to the proper proportions of the figure and the correct perspective of objects in general.

“The looseness of drawing, even of great painters, deservedly so called, of fifty years ago, and their errors as to perspective, would not be tolerated now; their faults then remained undetected. Science ever leads the van, beckoning Art to follow; and though artists may pool-pool the photograph, and refuse to see any artistic beauty in it, yet they must admit that it has already been productive of much improvement. It has taught the world to be more exacting in its demands for accuracy of drawing and closer study of perspective, the alphabet of drawing, and thus supplied a much-needed incentive to the artist to neglect no means of perfecting himself in the knowledge of his work.

“The engraver, at any rate, might very profitably study photographic line—its invaluable hints only wait his research to prove profitable. They offer a field of investigation likely to yield secrets that will afford him satisfaction, and help him to render his reproductions scientifically and artistically, and with full power.”

Concurrently in dealing with line, the writer deals with wood engraving as only a man can who has spent years in its practice; dropping hints, drawing comparisons, and making generalisations which cannot fail to touch a chord of harmony in the breasts of others desirous of seeing English work still to the front. Not only does he confine his theory of line to wood engraving, but he deals with its application to all poster work and chalk drawing, and in a number of paragraphs gives a series of good suggestions, particularly to the poster draughtsman. Speaking of posters leads the writer into a dissertation on zincography, and the use of the now obsolete litho plate. The many points raised will not be lost sight of by the intelligent reader, and not a little good is obtained by a careful reading of this portion of the work. But, throughout, it is noticeable that the book has been written from the wood and letterpress side. Wherever lithography is dealt with, there is an amount of uncertainty which the writer could not have revealed if he had as wide an experience of lithography and its little eccentricities, as he possesses of wood engraving. His references to the litho plate are sufficiently exhaustive; but the difficulties which he points out have been surmounted by subsequent patent plates. If, however, there are apparent errors of detail here and there, they are pardonable from the fact which the writer himself gives, that “it is no part of the programme to reproduce in another form a technical treatise on any one of the branches of printing.”

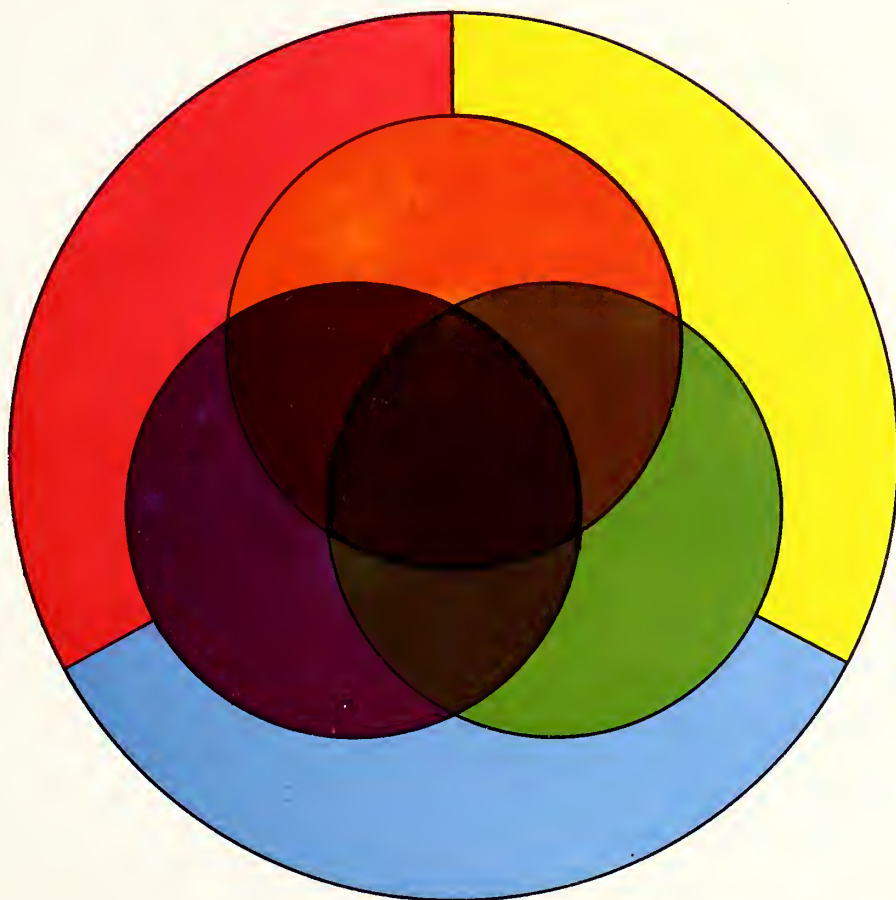
Although not absolutely a technical work, yet he frequently goes deep into the details of some favoured point. On the whole, the work should be considered as roundabout papers on printing, arising from a spontaneous desire to express certain opinions upon certain points which are undoubtedly worth the pains taken in giving expression to them. The occasional somewhat slang phrases—not by any means technical—might have been better left out, and would have raised the tone of the whole work.

Many other points recommend themselves to our notice, but space does not permit us to trespass further, or we could shew how well the author opens combat with employers, with customers, with travellers, and with art schools, on good sound technical points; how he favours strongly the increase of technical instruction, including chemistry, for the printer; and how he urges the necessity of good estimating, pointing out that it is frequently a gain to lose an order rather than obtain it by bad estimating.

The style of the book is conversational, and it is refreshing to read the work, having as it were a chat upon the bad management of printing firms, arising so often from the manager himself being almost ignorant of the business; and listening attentively to the suggestions which come from the author's pen.

Yellow: PRODUCED BY { Yellow Lake, N<sup>o</sup> 713. at 6/- per lb.  
 Gold Chrome, N<sup>o</sup> 707 at 2/- per lb.  
 Lemon Chrome, N<sup>o</sup> 709 at 1/9- per lb.  
 Vermilion, N<sup>o</sup> 266 at 3/6- per lb.

# DIAGRAM OF COLOUR FORMATION SHEWING PRIMARY COLOURS,



## SECONDARY & TERTIARY COMBINATIONS.

PRINTED WITH FRANK HORSELL & CO'S (LTD)  
 LITHOGRAPHIC INKS.

HEAD OFFICE & WORKS, 47 MEADOW ROAD, LEEDS.

Geranium Lake, N<sup>o</sup> 285, at 10/6- per lb.  
 Chinese Blue (REDUCED) N<sup>o</sup> 3, at 4/- per lb.  
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 A.S.C. Black at 5/- per lb.

PRINTED ON CHROMO PAPER SUPPLIED BY SMITH & M<sup>o</sup> LAURIN. JOHNSTONE, SCOTLAND.  
 211 C, D. Crown, at 19/6- per ream.





# What is Colour?

## CHAPTER VII.

**I**N the last chapter it was pointed out that for practical purposes we must consider red, yellow, and blue the PRIMARY PIGMENTS, and that colourists have realised the value of an extensive palette, rather than a limited one. Although in succeeding chapters reference will often be made to these primaries, and their compounds closely discussed, yet it will always be with a view to shew the value of colour knowledge, rather than to lay down an imperative law that such colours, and such colours only, must be used to obtain colour effects.

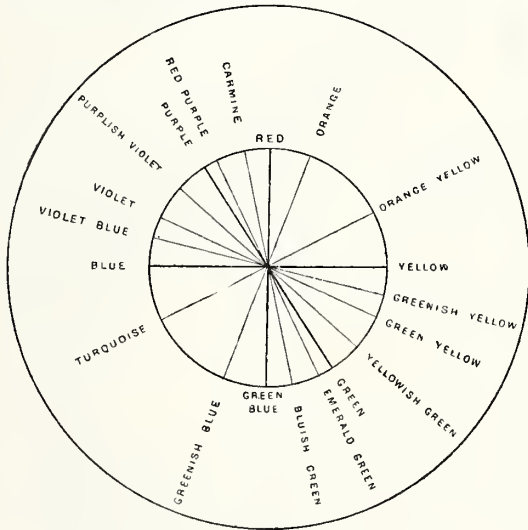


FIG. 1.

Spectrum Chart, arranged to show complementary colours.

It is true that in previous chapters the solar spectrum, or spectrum of white light, has been dealt with somewhat in detail, but it has been left for the present purpose until now to shew more in detail the complex nature of the colour in white light. To do this in a diagrammatic fashion, the following chart has been designed by previous colourists, and may well be used in the present connection. The circumference of the circle represents the spectrum band joined at its extremities, and the designations of the colours amply justify such a junction, since they apparently merge more or less rapidly into one another. The diagram, however, has further uses, which will be dealt with subsequently.

Much has been written with reference to the colours of the spectrum, but, so far, no attempt has been made in these pages to point out what the colours actually are. Most people can take a piece of prismatic glass and observe the spectrum colours of white light. Recently, a grand effort has been made to actually retain by photography the spectrum colours, and the success attained is but a step in the right

direction for photographing in colour. This latter experiment can be carried out by any photographer, and the plate obtained can be used at any time for a guide as to the real spectrum colours. But as these means are not permanent standards, it is necessary to have a printed or washed copy which can be always handy for reference. Such a copy can only be prepared by a colourist having very acute colour vision, and capable of carrying a lasting impression of the colours viewed. The colourist must use the prism, and, if possible, the photographed spectrum mentioned above, together with the circular chart, and in course of time will be able to work out the entire scheme, using the following pigments to obtain the hues :—

RED—Madder red, or crimson vermillion.  
 ORANGE—Cadmium yellow of orange hue.  
 ORANGE YELLOW—Deep chrome.  
 YELLOW—Lemon yellow, pale chrome, or aureolin.  
 GREENISH YELLOW—Aureolin with a little viridian.  
 GREEN YELLOW—Lemon yellow and a little emerald green.  
 YELLOWISH GREEN—Lemon yellow and much emerald green.  
 GREEN—Emerald green, with a little lemon yellow.  
 EMERALD GREEN—Emerald green.  
 BLISH GREEN—Cobalt green, with a little emerald green.  
 GREEN BLUE—Viridian, the emerald oxide of chromium, with a little cobalt.  
 GREENISH BLUE—Cobalt green (*vert de cobalt*).  
 TURQUOISE—Ceruleum, or cobalt blue, with a little emerald green.  
 BLUE—Ultramarine (*lapis lazuli*).  
 VIOLET BLUE—French ultramarine and a little madder carmine.  
 PURPLISH VIOLET—Madder carmine, with French ultramarine.  
 PURPLE—Madder carmine and French ultramarine.  
 REDDISH PURPLE—Madder carmine, with a little French ultramarine.  
 CARMINE—Deep madder carmine.

The above tabulation shews not only the variety of colours in the spectrum, but it indicates the purity of colour, as well as the fact that to imitate such colours the best pigments only are available. In printing such a scheme of colour it would be a very intricate matter, and in all representations a great allowance has to be made for the lack of brilliance, and the apparent loss of the beautiful gradations which are really present in the spectrum band. Again, the quantity of each is so small as in several cases to be represented by mere lines, and to the ordinary observer, lost by contact with the adjacent colours.

The table has its uses, and there is not a single colourist who cannot fail to find some item of value in it which he can turn to good account.

The circular chart and descriptive table convey an exaggerated view of the spectrum, and the following diagram is added to give a correct notion of the colours and their position in the spectrum, as well as to elucidate many of the previous details in these papers.

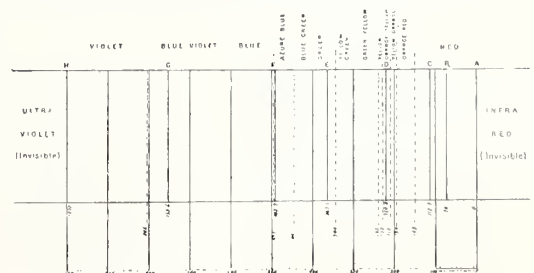


FIG. 2.

Scale diagram of the solar spectrum divided into 1000 parts, shewing the principal Fraunhofer lines and the exact proportions of each hue.

[This diagram will be given in colours on a full page supplement in next number.]

## DIAGRAM OF COLOUR FORMATION.

The coloured diagram accompanying this chapter shows in the outer sections the primary pigments—red, yellow, and blue. These pigments are not prepared from any single pigment, but are compounded from pigments which give the finished colour sensation as nearly like the pure spectrum colours as possible. Thus the yellow is compounded from yellow lake, gold chrome, and lemon chrome; the red is prepared from vermilion and geranium lake; and the blue from Chinese blue and violet lake.

The key diagram, here appended, will assist the reader in discriminating the various sections referred to. Those marked (1) are the primary pigments; (2) the secondary combinations, and (3) the tertiary combinations.

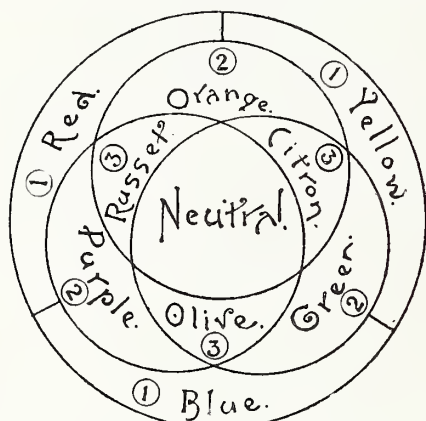


FIG. 3.

Key to the coloured illustration, showing the primary pigments, with the secondary and tertiary combinations.

In the pointed crescents, overlapping the primary pigments, the primary pigments of the two external adjacent sections overlap one another and produce the secondary combinations: orange (from red and yellow), purple (from red and blue), and green (from yellow and blue).

Finally, to obtain the effect of printing the secondary colour combinations—green, purple, and orange—one over the other in succession, the primary pigments have been printed twice in the centre portion of the diagram formed by the three lozenges overlapping one another in the central curved triangle. Thus the lozenge with its point between the green and orange has two printings of yellow upon it, printed in succession at the commencement: one printing being the one which forms the primary and the secondaries, the second to form the tertiary. The lozenge with its point between the green and purple has similarly an extra printing of the primary blue upon it, and the lozenge with its point between the purple and red has an extra printing of red upon it. The result of this is that those lozenges are the result of printing the secondaries one over the other. Reverting to the first lozenge, it consists of the first printing of yellow with the red to form the orange, and the second printing of yellow with the blue to form the green. Since both orange and green contain yellow, it is necessary to

make the tertiary combination by the printing of two yellows, one red, and one blue; the tertiary product being citron. In like manner the second lozenge contains the first printing of blue with the yellow to form the green, and the second printing of blue with red to make the purple. Thus the tertiary compound olive contains printings of two blues, one red, and one yellow. The third lozenge is made up of the first printing of red with the blue to form the purple, and the second printing of red with the yellow to make the orange; these two secondary combinations forming the tertiary combination, russet. In the centre the combination really consists absolutely of overlapping the tertiary combinations—citron, olive, and russet, and is a dark neutral grey.

With whatever primary pigments are used a very close approach to these combinations is produced, and the colour printer can always judge approximately from the result here shewn.

## Litmus Paper.

**A**MONG the various industrial and chemical uses of seaweed none is perhaps more interesting than its utilisation in the production of the well-known litmus paper. For this purpose there is used the common roccella, which is found in all tropical seas, but particularly and abundantly in the Mediterranean, being, in fact, a lichen which grows on the rocks in the water and near the shore. The litmus is prepared by macerating the plant in water with lime, potash, and other substances, and leaving it in this condition until fermentation follows. On this taking place it first turns red and then blue, and on the whole mass becoming of the desired blue colour, it is pressed into a mould and made into small rectangular cakes, which have the appearance of indigo and the smell of violets. In producing the litmus an infusion of the latter is made with boiling water, and unsized paper is soaked in this, being afterwards dried. The natural colour of the paper is blue: the red litmus is made by treating the preparation with acids so as to give it a reddish tinge. This is the paper which is used by paper manufacturers, during the process of preparing the pulp, to test whether it is acid or alkaline. Blue litmus paper turns red if it be acid, and red litmus paper turns blue if it be alkaline. This method of testing is an exceedingly sensitive one, and could be used by printers to test the chemical action of the pigments used in colour or black printing.

(1) ART faculty is innate; it cannot be acquired. It is a moral and intellectual force, which may be enhanced by cultivation, but cannot by any means be created. (2) It may be debased by example or wrong teaching. (3) The action of any academy, founded and carried on with certain set doctrines, has no other effect than to associate artists. (4) I attach no value to technical superiority, or to what tradition teaches. (5) Too minute a rendering in matters of art is bad. (6) The best art is conventional—that is to say, suggestive rather than imitative.—SEYMOUR HADEN.





## Book Notes.

“**P**ROFIT SHARING AND THE LABOUR QUESTION,” by T. W. Bushill (Methuen & Co., 18 Bury-street, E.C.; 2/6), forms that much appreciated desideratum—*practical* information by a *practical* man.

Many writers have recorded their views on this rapidly growing movement, and public men are ever advocating some phase of it as a remedy for the evils attendant on unprofitable labour and the growing demand for better remuneration amongst workers. As has been recognised by the author, a consideration of the labour question by employers and employees alike often naturally tends in the direction of considering the adoption of some method of profit-sharing, in order both to increase the output and quality of their work, and also the wages received by the workers. So much again has been published from economical and theoretical standpoints on the subjects, that Mr. Bushill's book will be heartily welcomed as a reliable contribution from a business point of view. In its descriptions of attempts to solve some of the knotty points presented in the labour question the book is wide reaching, for not only does it detail schemes already in operation, but brings to bear on every side a large amount of instructive information as to cause and effect. At the same time, with Mr. Sedley Taylor in his able introduction to the book, it must be inferred that profit-sharing is to be regarded “not as a final solution of the labour question, but as a stage on the road towards co-operative production and the emancipation of labour.” To sum the book up briefly, the author deals in a practical straightforward manner of profit-sharing as practised in the firm of Thomas Bushill & Sons, Coventry. Detailing the circumstances leading up to their adoption of the scheme, he explains the various steps taken with their immediate and after results. A special chapter gives Mr. Bushill's evidence in reply to questions before the Labour Commission, dealing exhaustively with many phases of the subject which will prove especially valuable to enquirers. The profit-sharing system—pure and simple—is made the subject of a separate chapter, and here the system is defined, classified, and treated statistically and comparatively in all its ramifications. There is also a great deal of accessory information relating to kindred matters, including special chapters on the growth of the movement, the systems at present in operation, working hours and rates of wages, and desirable legislative and administrative developments. An appendix gives rules for working and general regulations, etc., of the scheme at work at Coventry. Sufficient has been said to show that the book deals in a thoroughly business-like and exhaustive manner with the subject of profit-sharing in its connection with the labour question. There

cannot be two opinions as to the value of the publication both as a contribution to current literature on economical matters and in its more immediate application of profit-sharing. All who take the least interest in labour developments, and in the proper evolution of the worker, should give this book their careful attention. It cannot fail to be of interest, and will probably prove highly suggestive to employers in all branches of industry.

The publication of “*L'Art Impressionniste*” by Georges Lecomte, should do much to clear the air of art fanaticism on the recent departure known as impressionist pictures. Probably the unwarranted bias arose because those who spoke did not really know what an impressionist picture was. Georges Lecomte comes to the rescue and puts it plainly in the words of *The Art Journal* as follows:—“After showing the close ties which connect the impressionists with their immediate predecessors of the Barbizon school, Mr. Lecomte proceeds to deal with their still greater efforts to shake off all fetters of conventional rules. To become thoroughly intimate with nature, and to study her each one with his own vision, and then record with sincerity the impressions personally received: such are the aim and object of these men.” This school has returned to the works of J. W. Turner, and has discovered the value of a thorough knowledge of colour, especially in the use of spectral colourings and complementary tones.

THE growth of the 1892-93 issue of “ANTHONY'S PHOTOGRAPHIC BULLETIN” (vol. V.) is such that it is half an inch thicker than its predecessor, and its popularity is such that there is some difficulty in securing copies within a short time after publication. As a record of the progress of photographic art during the past year it is wonderfully complete and interesting, the list of contributors, which alone occupies four pages, includes all the leading spirits practising the art, who freely give to the photographic world the results of their valuable experience. The illustrations, whether as photographs or as examples of the photo-engraver's art, are decidedly in advance, both in artistic effects and printing, of any previous year, and add immensely to the value of the book. An almanack recording events of photographic interest is a useful feature.

“THE BRITISH AND FRENCH CALCULATOR” (by John Williams, Walsall; 2/-) is worthy of a place in all business houses. Dealing exhaustively with French currency, quantities, and sizes, giving equivalents in English money, weights, and measures, and including metrical and other French tables, the book effectively meets the necessity of knowing something of the varying foreign currencies and weights and their English equivalents demanded by the great increase of business with French houses.

MR. PHILIP G. HAMERTON'S work entitled “Drawing and Engraving” (Adam and Charles Black) has been republished with considerable extensions and additions, making it a most useful book to all students of etching.

## Specimens.

*[Will our friends kindly remember to send their specimens either TIGHTLY ROLLED or FLAT BETWEEN BOARDS; the cost is but a trifle more, and for review they gain in being presented as they come from the machine. If sent unprotected, specimens are usually so crushed and disfigured as to be utterly unfit for criticism or preservation.]*

**A**NOTHER charming collection of collotype work comes to us from the antipodes in the shape of an oblong 4to panorama of "Marvellous Melbourne," being one of a series of similar works dealing with "The Cities and Towns of Victoria," published by Messrs. W. F. Niven & Co., art printers, Ballarat. The work consists of thirty-five plates, daintily printed in various art tints (monochrome), with a few in colour and tints. In some instances the whole page is given up to one picture, but in the majority a number of views, buildings, interiors, portraits, etc., are artistically arranged on one page; high artistic taste being shewn in the grouping, and in the floral decorations introduced to make each picture an harmonious whole. The pictures are reproduced by the "Crisp Photo Process," from original designs, photo silver prints, and direct negatives; and for delicacy of detail and general excellent effect could not be surpassed anywhere in the old country. Those in which colour is introduced are exceptionally fine, and quite equal in effect to the best of chromo-collotype work we have yet seen. That such admirable work can be produced by Australasian photographers and printers shows how great has been the progress of the graphic arts at the antipodes. Messrs. Niven and Co. have kindly promised to print a specimen page from this handsome work as a supplement to the B.L.

A HANDSOME calendar, both in design and execution, is that from Messrs. Ash & Co., Southwark-street, S.E. It is about demy size, designed the oblong way of the sheet, and has for centrepiece a charming view of the famous "Burnham Beeches," the calendar appearing in tablets on either side, surrounded by boldly-drawn conventional floral ornament, the name and address in panels at the top and bottom being in very neat, well-proportioned lettering. The panels are all enclosed in deep red border lines in a deep chocolate ground, a wide border in plain lines of green, buff and grey tints and gold, giving a very effective finish to a very attractive example of chromo-lithography.

MESSRS. CHORLTON & KNOWLES, Manchester, are hard to beat in the admirable style in which they get up lithographed illustrated catalogues of Manchester goods. We have previously commended their work in this line, but the latest examples show a still greater advance in tasteful effect, especially in two catalogues in which all the new designs are shewn in relief in solid gold grounds, the descriptions on the opposite pages being also in gold, but on white grounds. The accompanying specimens of commercial stationery, business cards, labels, etc., show equal good taste and high executive skill, and in every respect sustain the reputation of the firm for finished work.

ANOTHER fine collection of copper-etched half-tone work is sent us by Mr. W. H. Bartholomew, of Spruce-street, New York, U.S.A. It comprises a series of rich designs in silversmiths' work, illustrations of musical instruments, a series of illustrations of New Testament subjects, portraits, groups, *genre* subjects, American scenery, and a charming series of full-page illustrations to a handsome reprint of Tennyson's "Holy Grail" (published by D. Lathrop & Co.) Finer specimens of half-tone work have never come to our notice. We hope to be able to show some of these fine productions in an early number.

MESSRS. HUGHES & HOLGATE, Burnley, submit a dozen very artistic examples of their ability as draughtsmen and designers. Amongst them are: a handsome technical school certificate for the Burnley Corporation, a new memo. heading for themselves, several excellent examples of chalk work, a series of drawings (plans) of wrought-iron work, and several attractive business circulars in old and modern styles. In every case the design and grouping is effective, the drawing correct and tasteful, and the lithographing excellent. Better work could scarcely be desired.

MR. W. H. EDWARDS, of Birmingham, sends us his very tastefully got-up specimen showcard of "Visiting Card Styles," arranged in the shape of a fan, in front of a pretty water view. The names on the cards are printed direct from plate in a warm brown colour, and the design in a neutral greyish-green art tint on white card, mounted on a light Caledonian grey carton, and provided with a cord for hanging up. The execution is in the highest style, and the effect decidedly artistic and chaste.

A WELL-EXECUTED portrait of Dr. Clifford, the popular pastor of Westbourne Park Chapel, has been published by Messrs. Veale, Chifferiel & Co., Ltd., 37 Cursitor-street, E.C. The portrait is lithographed in black and tint, with facsimile signature, on a sheet  $22\frac{1}{4} \times 18$ -inches, and sells at 1/-. Copies can also be had on india paper at 5/- each. The printers, who are also the publishers, are to be commended on the finished excellence of their work.

\* \* \* \*

DEATH OF MR. ADAM PATON.—We regret to record the death of a well-known Leeds inventor, Mr. Adam Paton ("father of the litho machine trade in Leeds"), which took place on the 7th of January. Mr. Paton, who was the fourth son of the late Mr. Hugh Paton, publisher, of Edinburgh, was born in that city on March 31st, 1836. He served his apprenticeship with Messrs. Bertram, engineers, Sciennes, Edinburgh. Being a clever draughtsman and designer, he worked for two years in that capacity in London, at Messrs. Dryden's, in Lambeth. He came to Leeds in 1865, and was the founder of the present famous litho machine trade, making the first litho machine producing *perfect register* work. Mr. Paton was also the inventor and patentee of many useful patents outside this class of machinery. He had for some time been working at a multicolour machine, and has also left in a complete state a valuable patent in connection with improvements on the gas engine.



PHOTO-LITHOGRAPHED BY  
F. W. SEDGWICK, BRIDGE HOUSE, QUEEN VICTORIA STREET E.C.







## Trade Reports.

### BELFAST.

**A**S SOCIAL REUNION in connection with the firm of Marcus Ward & Co., Ltd., was held in Messrs. Thompson's restaurant, Donegal-place, Belfast, on Saturday evening, Feb. 25th. About a hundred of the employées from all departments sat down to an excellent repast, which was presided over by Mr. F. D. Ward, J.P., M.R.I.A., chairman of the company, supported by the managing director, Mr. G. G. Ward, the vice-chair being worthily filled by Mr. J. Vinycombe, M.R.I.A. After ample justice had been done to a capital dinner, the proceedings took the form of a smoking concert, the various toasts being alternated with musical items. The chairman, who was accorded a most hearty reception, expressed the pleasure he experienced at presiding over such an assemblage. The gathering was unique, the first of its kind he had had the pleasure of attending, and he hoped it was but the forerunner of many such meetings. In common with many similar establishments, they had had their periods of adversity as well as of prosperity in trade, but he had good reason for saying that bright though the present was, it was also an indication of even brighter days in store. He announced the receipt of a telegram from the manager, Mr. Frame, who was unavoidably detained by business in London, expressing regret at his inability to be present. He then proposed the first toast, "The Queen and Royal Family," which was enthusiastically received. The remaining toasts were: "Prosperity to the Firm of Marcus Ward & Co., Ltd.," proposed by the vice-chairman, and suitably acknowledged by the chairman and Mr. G. G. Ward; "Art and the Reproduction of Art," replied to by the vice-chairman; "The Lithographic Department," acknowledged by Mr. Gyoer; "The Typographic Department," by Messrs. Stewart & McLeod; "The Volunteer Fire Brigade," coupled with the name of Mr. Lewis; "The Bookbinding Department," connected with the name of Mr. Roy, who acknowledged the honour. Vocal and instrumental music, interspersed with recitations, contributed by the following employées, gave additional interest to the proceedings: Messrs. J. Scully, H. Johnston, Hubling, W. J. Morrow, Tate, S. Kerr, S. M. Kee, R. J. McCormack, D. Burrows, Wilson, J. Bratten, and E. Raine. Mr. G. Ward also rendered two humorous songs. On the motion of the vice-chairman, a vote of thanks to the chairman was passed by acclamation. The customary singing of "Auld Lang Syne" brought a most enjoyable evening to a pleasant termination. A word of praise is due to the hon. sec., Mr. James Shannon, to whose exertions the success which attended the meeting is largely attributable.

### DERBY.

THE lithographic trade is reported as being somewhat better than mentioned in last issue, though business is very quiet all round.

THE Society has succeeded in obtaining another local firm on their list of Union houses.

THE second annual report of the Derby and District Trades Council shows gratifying progress during the past year. The records of work done and the satisfactory state of the balance sheet shows that the council is worked on a satisfactory basis. Among the officers we note the names of the vice-president, Mr. W. Hadley, and the treasurer, Mr. T. H. Wigley, as representatives of the Typographical Association; and the assistant secretary, Mr. W. Clarke, of the Amalgamated Society of Lithographers. Mr. T. Mawbey, of the Typographical Association, is one of the labour members on the Derby School Board.

### GLASGOW.

THE lithographic printing trade in Glasgow is fairly busy for this season of the year. As showing the increasingly close connection between the two branches of the art, the employing printers and lithographers have this year combined their annual dinner, which took place on Tuesday, March 7th, at the "Windsor" Hotel, when Dr. Blackie occupied the chair. Now so many lithographers are taking up letterpress printing, and *vice versa*, the amalgamation of the two employers' associations may possibly follow in due course.

### LEICESTER.

LEICESTER printerdom mustered in force on the evening of March 13th, at the "Hare and Pheasant" Hotel, at a smoking concert under the auspices of the popular Caxton Swimming Club. Mr. W. H. Lead, president, was in the chair, and a capital programme was heartily enjoyed. Messrs. Johnson, O'Donnell, Tilley, Briggs, Allcroft, Freestone, Herbert, Pickering, Readings, Russell, and Sutcliffe contributed to the evening's entertainment by songs, etc., in right hearty fashion, Mr. Johnson accompanying on the piano. Mr. G. Maclachlan, by some clever card and other sleight-of-hand tricks, successfully mystified the audience, to their mutual gratification. Replying to a vote of thanks passed with musical honours, the chairman expressed pleasure at the success of the gathering and at the excellence of the contributions to the evening's harmony, shewing yet another indication of the *esprit de corps* among the members of the ancient craft in Leicester; they were proud of their old fraternity, and evidently were capable of excelling in other departments besides printing. Mr. F. C. Shardlow, as secretary, acknowledged the vote of thanks accorded to those responsible for the arrangements which had so thoroughly contributed to the evening's pleasure.

### LIVERPOOL.

TRADE here continues much the same as when reported last, the majority of houses are very quiet, while one or two are so busy that frequent overtime is necessary.

### NOTTINGHAM.

THE annual conference of the council of the Nottingham and District Printing and Kindred Trades Federation, with the committees of the affiliated unions, was held at the "Spread Eagle" Hotel, Goldsmith-street. Mr. John Read (Typographical Society), president, in the chair, was supported by Messrs. E. Stevenson (Lithographic Printers' Amalgamation), treasurer; Franz Ludwig (Lithographic

Artists', etc., Amalgamation), secretary; A. W. Jones and T. Cheetham (president and secretary, Typographical Society); W. C. Falconer (president, Lithographic Artists); J. Pagdin (Lithographic Printers), etc., upwards of thirty representatives being present. Among the subjects discussed were the organisation of unorganised labour in printing establishments, the eight hours question, and the amicable settlement of trade disputes. New rules, recommended by the council, were afterwards considered and adopted.

#### NORWICH.

A SOMEWHAT unique case of long service was noted at the recent funeral of an old employé of Messrs. Jarrold & Son. Deceased had been in the service of the firm forty-five years; and appropriately enough six other old employés attended the funeral service as bearers, each of them averaging over forty years in the service of the firm, the united ages of the six totalling to over three hundred and fifty years.

THE LATEST WONDER.—J. E. Blackmore, an artist, has made application in Washington for patents to cover a new invention called the "Reflectograph." This machine will undoubtedly cause much interest among photographers, as the "Reflectograph" is so constructed that it can be used where any ordinary hand camera is used, but instead of making a single picture of a certain view or object, it records every movement of any object before it, and by a very simple arrangement. It can be reproduced at any future time upon a ground glass screen similar to that used in the ordinary camera. This is done by reflected light, and the results are so perfect that not the slightest thing can escape it, no matter how fast or slow it may be moving. The pictures are taken on an endless belt, which moves automatically with the shutter, causing the exposures to be made at a very rapid rate, varying from twenty to one hundred per second, as can be regulated by an indicator which designates the time necessary to catch the moving object to be taken. Those who have seen it work say it is wonderfully surprising, so perfect are the results.—*St. Louis Photographer.*

"THE AMERICAN DICTIONARY OF PRINTING AND BOOKBINDING," now being issued from the Lockwood Press, New York, has progressed half way through the alphabet with its eighth number just published. When finished it will be a useful and valuable work of reference. We notice, however, in this part one or two errors. "Lichtdruck" is not an "outline" process: it is the equivalent in German for the French "collotype" process. It is also stated that "English lithographic houses suffer on account of the better artistic education of the Germans." It is well known that all the English work done in Germany is designed and coloured in England, and only sent to Germany to be printed, on account of the supposed better printing done there. In reality it is because of the cheapness of labour there. Such houses as Marcus Ward & Co., Belfast, and Thos. De la Rue & Co., of London, can meet the Germans in their own field, and there are many others equally able to do so if given a fair chance.

## Technical Classes.

#### GLASGOW.



HE employing lithographers of Glasgow at their last annual business meeting (Mr. Gardner, president, in the chair) had before them the report of the committee appointed to arrange for forming technical classes during next winter. The report showing that much work in this connection still remained to be done, the matter was held over till next meeting.

#### LEICESTER.

THE class meeting here on Wednesday, Feb. 15th, was an exceptionally interesting one. Mr. E. T. D. Stevens (of the De Montfort Press litho department) described and illustrated the artistic uses and labour-saving advantages of Day's Shading and Printing Mediums as applied to lithography. Mr. W. O. Felt, the British agent for Mr. Day, was present, and expressed himself highly pleased with Mr. Stevens' lucid description and expert manipulation of the mediums. Mr. S. D. Hall, the able teacher of the class, afterwards gave an interesting description, with illustrations, of Eberle's Burning-Etching Process as applied to lithography. Several friends and members of Mr. Hall's Derby class were present.

#### LIVERPOOL.

THE Patent Lithographic Zinc Plate Co., Limited, Hull, have offered several substantial prizes to be competed for by the students attending the litho technical class for the best results from the Hull plates, which have been accepted by the teacher, Mr. J. Honeyman; plates, etc., being supplied by the Company. The conditions attached to the competition will be published later on, with results.

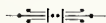
MR. W. T. WILKINSON, of Manchester, began his course of four special lectures on Thursday evening, February 23rd, with "Photo-zinco in Line." He will follow this with "Photo-zinco in Half-tone" (March 2nd), "Photo-lithography in Line and Half-tone" (March 9th), and "Collotype" (March 16th).

OUR American friends are waking up in earnest on the strong necessity for suitable technical education for lithographers. The project for a lithographic school in connexion with the Drexel Institute at Philadelphia is being warmly taken up, the plans for its formation and course of instruction finally adopted, and the trustees of the Institute have agreed to set apart a sum of money to defray the expenses. A competent teacher is being advertised for, but seems difficult to secure, the right man being apparently as scarce there as here. Where's Mr. Fred. Buehring?

A CLASS for technical instruction in lithography has been commenced in the Government lithographic department at San Jose, Costa Rica, under the direction of the official lithographer, Señor Edwarde Lehner, and is open to students of both sexes. An examination was recently held before the Minister of Public Instruction, but only three candidates were then able to pass, two in the first-class and one in the second.



## Notes and Queries.



**I**N reply to "F.K." (Sheffield), who sends us an excellent first effort in printing upon tin, we can say that it only requires more experience to improve the quality. In the first place, the showcard sent for comparison is executed by Messrs. Wm. Strain & Sons, transparency printers, Belfast, who have always produced work having high brilliancy or gloss upon the surface. In the showcard this gloss is obtained by the process of gelatinizing. It is easy to detect gelatinizing; by washing the card repeatedly in cold water, it soon becomes sticky. Varnished showcards do not give the same result. Gelatinizing is not resorted to in work upon tin, because the methods of enamelling are more permanent. Printing upon tin is not permanent unless partially absorbed by the tin. To effect this absorption, the tin should be first subjected to a sandblast or etching. Upon this the colours can be printed one by one, and after each printing the tin should be baked. The baking not only incorporates the colouring pigment with the tin, but if mineral pigments are used, as in pottery painting, it finally gives a gloss which cannot be equalled by plain varnishing. The process, properly pursued and finished by a dip in the glazing used in pottery, gives a well enamelled brilliant surface. To obtain the same effect by ordinary chromo-lithography is next to impossible. The pigments must be highly adhesive, must contain plenty of varnish, and finally the tin with the print upon it must be varnished two or three times with a firm hard-drying varnish. The only way, perhaps, to obtain a brilliant varnishing is to use the same class of materials as used in lacquering tin. Lacquering tin is effected, for silver lacquering, with a clear oil varnish, and is most effective.

IN reply to Mr. Gordon, of Glasgow, it seems very probable that you could use several means of promoting better transferring from plate to stone. One of the mistakes often made is to use a soft retransfer ink, which readily melts into the engraving, and is so soft that in cleaning the plate considerable care has to be taken not to wipe out the ink from the engraving. It is this which prevents the lines being cleaned down sufficiently and leaves them overloaded with ink. Supposing this to be the case, when the transfer is pulled it should be placed face down on a clean piece of printing paper and run through the litho press on a stone. The effect of this is to relieve the lines of a lot of superfluous ink, and assist the transfer in being finally transferred much finer. Although this is a common and often successful method, it is better to start well rather than to adopt it. The copperplate transfer ink should be hard. It should contain plenty of wax, not pitch, so that it will melt readily, but will set firmly in the lines and leave the plate clean and sharp. Such ink may be obtained from Messrs. Winstone, Shoe-lane, London. There is also a method noticed in a previous number of this journal, in which after transferring the transfer is gummed and dried. The work is then washed out with turpentine.

The liquid known as "lithophile" is next flowed over the transfer. When dry it is washed off and rolled up without etching, usually giving very fine results.

### STRIPPING FILMS FOR COLLOTYPE AND ZINC BLOCK ETCHING.

J. B.—It is quite possible to *strip your films*. *The Amateur Photographer* recently gave the following as the best way to do it:—Lay the cracked negative on a sheet of glass the same size, then pour on as much enamel collodion as you can get on without running off the edges. Allow the collodion to set, then place the negative on the glass in a dish (ebonite or zylonite) containing fluoric acid 1-dr., water 10-oz., till the film begins to frill and blister, then, by the aid of a soft camel-hair brush, coax the film off. When quite free remove to a dish of clean water, which change two or three times in half an hour. Clean a sheet of glass slightly larger than the original, very carefully slip into the dish under the film, straighten the latter out by the aid of the brush, raise gently from the water, lay perfectly level, and smooth out by blowing and gentle brushing. We do not recommend mercury and hypo; we may have recommended mercury and sulphite. You could use Monckhoven's preparations, but you would not have to bleach right through.

[Several questions having arrived late, the answers thereto are unavoidably held over till next issue.]



IN *The Art Journal* for February there is a very realistic photogravure production from Vical Cole's (R.A.) picture of "Westminster," apparently in the mists so frequently seen upon the Thames. The illustrations of soldiers in the article on Berne-Bellecour are not only amusing but are vigorous and instructive as figure studies. *The Art Journal* for March contains an etching by C. O. Murray, from the picture "The Vale of Rest," by J. Millais, Bart., R.A. It need only be seen to be appreciated. The designs for the new coinage by Mr. Poynter, R.A., and Mr. Brock, R.A., show a decided improvement upon the abominable jubilee design, to which we shall bid a hearty good-bye. The style is very plain and readable. If anything the lettering is made a little too heavy, and cramps the centre design. The old symbol of barbaric adornment is retained by putting in the earrings and necklace on the "head" of the English race, similar to the customs of the present Cingalese and African negroes. Some copies of Mr. Whistler's pictures are given in gold and purple, grey and green, pink and grey, etc., which are very interesting as illustrating that artist's work in "oil." The ideas are baldly presented without any assistance from artistic treatment of surroundings. It is in this that the "nocturnes" and "harmonies" excel, for instead of supporting the subject in detail, the suspicion of detail even becomes lost in nocturnal shade or harmonious glamour. Where detail is attempted it is of a formal and decorative character. This is the impression given by the inspection of a few works; possibly a wider exhibition might produce a different result.

## Trade Notes.

**T**HE colour printer is beset with difficulties on every hand, and perhaps the most troublesome and annoying are those proceeding from some defect in the paper used. Either the condition of the paper is apt to vary in an unaccountable manner, or the quality used does not suit the class of work in hand, and faulty register often results from paper stretching or shrinking even under the pressure of the cylinder. Various attempts to remedy this have been made, but all are unsatisfactory and prove of little utility in

*The Magazine of Art* for February has presented its subscribers with another of those very fine photo-mechanical productions from the picture of La Zingarella, by Luke Fildes, R.A., and executed in photogravure by the Berlin Photographic Co. From the article and illustrations of "Current Art" the draughtsman may find some useful figures. Artists of the oil and water school are bestirring themselves to secure a better footing of copyright for their productions, and in this journal some suggestions as to a new bill are worth perusing. The second article on design is, if anything, better than the opening one, and will well repay those who carefully follow it. It is well illustrated. *The Magazine of Art* for March

contains a very smart etching of Mr. C. S. Pearce's picture "The Prelude," by Mr. S. A. Schoff. The rendering of the depths of colour give it that velvety darkness characteristic of mezzotint. The body of the March magazine is mostly taken up with portraiture, whilst the remaining illustrations are singularly wanting in raising any ideas which the designer could make use of. It is one of those numbers which must crop up occasionally in all journalism, and may be considered the harbinger probably of some far reaching and attractive scheme in view by the publishers.

NATURE must be the groundwork both of art and wit.—JOHN SELDEN.



### SMALL ADVERTISEMENTS.

#### Situations Wanted—Three Lines for a Shilling.

For re-postage of replies received at Publishing Offices,  
Six Stamps extra must be sent.

*Three lines (21 words) of the following classes, prepaid:*

1/6	{	Situations Vacant .. .. .		1/6
		Businesses to be Let or Sold .. .. .		
		Plant or Machinery Wanted or for Sale .. .. .		

EACH ADDITIONAL LINE, 6d. EXTRA.

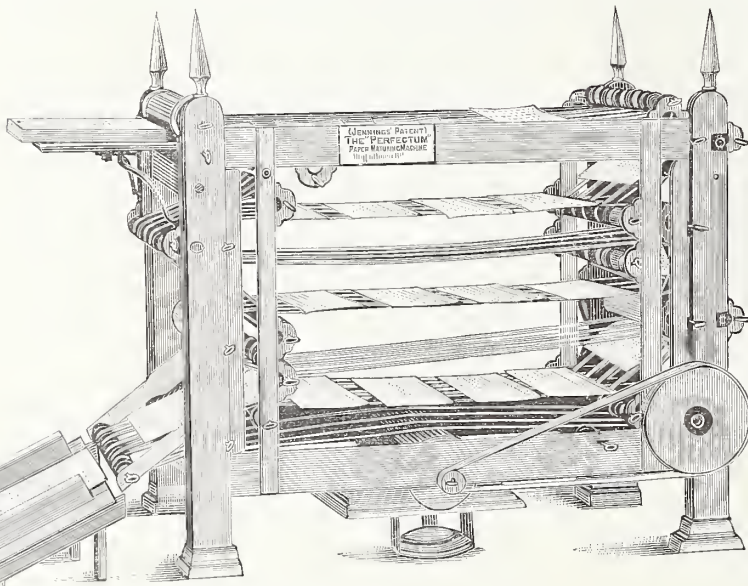
### SITUATIONS VACANT.

**FOREMAN LITHOGRAPHER.**—First-class all-round man wanted, 35 to 40; thoroughly capable, good disciplinarian, and wide experience.—Address, with full particulars, to "Box 99," De Montfort Press, Leicester.

### SITUATIONS WANTED.

**LITHO GENTLEMAN** is open to accept situation as manager or foreman; eight years (two years manager) in leading colour house in north of England; first-class experience in colour work and all the latest processes.—"B.G.," 60 Samuel-street, Camp-road, Leeds.

**LITHO ARTIST.**—Designer and General Hand, with good knowledge of the printing business, seeks situation.—Address, "DESIGN," office of this journal, Leicester.



the end. Recognising the real cause of this stretching and shrinking, Mr. J. P. Jennings, Liverpool, has invented and patented the "Perfectum" Paper Maturing Machine, which subjects every sheet to a current of warm, dry air, so regulated as to suit any quality of paper in use. This machine matures paper fast enough to keep half a dozen litho machines in full operation, occupies small floor space, and may be driven by a one-inch strap from shafting without pulley, no skilled attention being necessary. The machine has been thoroughly tested with the most gratifying results. Colour printers should write for particulars, or if possible, call and see it at work at Messrs. George Philip & Son's, 40 Hope-street, Liverpool, where it is reported to be giving the greatest satisfaction. Further information will be found on another page. Probably before our next number is ready a "Perfectum" Paper Maturing Machine will be at work at the De Montfort Press litho department, and we shall then have more to say about its working and utility for the purpose for which it is designed. The inventor is a practical lithographer of large experience, and has well studied the subject from an economical and labour-saving point of view, as well as from that of the production of more perfect work.





"THE WIDOW'S MITE."

REPRODUCED FROM ALMANAC FOR 1894, &c.

BY PERMISSION OF  
MESSRS. MARTIN BILLING, SON, & CO.,

BIRMINGHAM.



PRINTED WITH  
MANDERS' NEUTRAL PHOTO INK, 0323.  
AT 4 6 PER LB.







VOL. II.—NO. 11.

JUNE-JULY, 1893.

PRICE EIGHTPENCE.

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ISSUED EVERY OTHER MONTH, ABOUT THE END OF SEPTEMBER, NOVEMBER, JANUARY, MARCH, MAY, AND JULY.  
SIX NUMBERS FOR 4/- YEARLY.

Printed and Published by RAITHEY, LAWRENCE & CO., LIMITED, De Montfort Press, Queen-street, Leicester, to whom Business Communications should be addressed.

London: 1 Imperial Buildings, Ludgate Circus, E.C.

### The National Workmen's Exhibition.

WE would call especial attention to the various items of information in the present number relating to the forthcoming Workmen's Exhibition. A very little consideration will convince lithographers that they, collectively and individually, have a vital interest at stake in the success of such an exposition of home productions. Once let us conclusively demonstrate that the best and the cheapest—for the best *is* the cheapest—work has been and is being produced at home, then orders which customers may contemplate sending abroad *must* remain here, and so far as we can practically illustrate that English skill is second to none, that our work is honest and we are ever ready to meet criticism—thus far must personal and national profit result.

The exhibition aims at doing this, and it behoves all who can in any way help on the movement to do it promptly and thoroughly.

We would add that cheap fares are being granted by all the principal railways, for which intending visitors should see the various companies' own announcements and the daily and weekly newspapers.

In many cases, employes of large firms have arranged to visit the exhibition in a body—some on their annual outing—and for these the council of the exhibition, we understand, propose to issue day tickets at half the usual price.

The show of printed work in the Arcade Gallery, under the auspices of the Litho Artists' Society, and at the stand of the "De Montfort Press," in the south-east corner of the hall, is expected to be worthy of the occasion.

THE questions set in connection with the City and Guilds of London Institute Examinations in May last, for the technical classes in lithography, are being worked out by MR. CHARLES HARRAP, and will duly appear in our next issue.

## Artists and Advertising.

**A**T a meeting of the Society for the Encouragement of the Fine Arts, held at their rooms in Conduit-street, W., Mr. J. W. Waterhouse, R.A., presiding, Mr. John Leighton, F.S.A., gave an interesting address on "Pictorial Advertisement, its Use and its Abuse." Mr. Leighton said there were two kinds of advertisements. There were some that were necessary and not a few that were superfluous, some that approached the beautiful and many that were ugly, some that were attractive and not a few that were repulsive. Of the five senses possessed by mankind, that of sight had been the least protected by law, and the education of the eye the most neglected. Having traced the progress of advertising during the reigns of the Georges and of the Sailor King, Mr. Leighton said it was in the Victorian age that pictorial advertising had made its greatest advances. He, himself, had had the honour of designing the cover for the first weekly illustrated paper which had adopted it. Cuts were then introduced into the other pages, and finally into the text itself, so that at the present time one could hardly tell the rightful picture from the puff. The picture only appeared once, but the puff they had always with them. People used to bind up their illustrated papers, but now they thought twice before doing it. Advertising vans had been abolished, but the advertiser seized upon their omnibuses, and his announcements were often more prominent than the destination of the vehicle itself. Sylvan scenery was desecrated by boards, and the blue vault of heaven was made a background for sky-signs. Nothing was sacred to an advertiser. Railway platforms were a mixture of coloured posters and penny-in-the-slot boxes, and the name of the station was often the last thing to be seen. The first object should be the designation of the place, then its adornment, and a due allowance for advertising. Restriction or taxation might not be an unmixed evil, for there was no doubt that the practice was a great impost upon the advertiser, and some people might imagine that he took the cost out of the article he sold. But he did not think taxation would be advisable, though a penny a foot over a double-crown size would produce a large revenue and might reduce the multiplicity which was now so annoying. They were in a state of transition in this matter. The advertiser was dubious about employing good art, but he might say that the cost of producing an inferior design was often greater than that of a good one. The advertiser should know first what he wanted, and then discover a good artist to do his work. Mr. Leighton illustrated his address by a number of posters, after designs by various artists and others, the walls of the room being decorated therewith, including examples by Millais, Herkomer, Marks, Leslie, Poynter, R.A., Wylie, A.R.A., &c. &c.

In the discussion which followed, the chairman said advertising was so obtrusive in the present day that they could not get away from it. The people could not use all that was offered them, and if manufacturers could be induced to cease advertising they might sell

cheaper or give better articles. The only losers would be the advertising agents,\* whose services could be put to a more intelligent use. Mr. Forbes Robertson said the advertising mania was not a thing to be condemned altogether. They might control it, but they could never suppress it. He asked why the eye of the Londoner should not be delighted by things of beauty in lieu of the horrors which now met it at every turn, and trusted those who were younger than himself might live to see the metropolis the centre of art. As for the advertisers who offended—he would have them hanged, drawn, and quartered. Mr. Maguire spoke of the employment which was given, and the money which was spent by big advertisers. Mr. Broughton said they could not stop the deluge, but they might control it. Mr. Barrett combated the president's views, and said his fraternity were to blame that the artistic side of advertising had not been improved long since.† Mr. Robertson said if they only paid a long enough price the president of the Royal Academy himself would paint them a picture. Mr. Loftus Brock spoke of the impossibility of suppressing advertising and of the high quality of foreign posters, and the advantage of a poster show in London, as proposed. Mr. Leighton having replied, a cordial vote of thanks was accorded him, and a similar compliment to the chairman concluded the proceedings.—*Daily Chronicle*, May 12th, 1893.

\* How about the printers and billposters? We suppose they don't count in the lively imagination of the artists.—Ed. B.L.]

[† Bravo! Mr. Barrett.—Ed. B.L.]

## The Inventive Age.

### PHOTOGRAPHIC PROCESSES.

**L** touching upon the keen race which is being run between the various methods of illustrating books, papers, and periodicals, a contemporary thus briefly sums up the progress in photography.

There are still living many people who remember the daguerreotype photograph, and are reminded of it by the ferrotypes of to-day; but what a contrast there is between the old and the new photography. Landscape photography, by the assistance of the now common methods of obtaining the dull matt surface so closely resembling Indian ink or sepia tints, has reached the point of perfection; it only remains to photograph nature's colours and the scene is complete. This problem is troubling the souls of all progressive photographers. The experiments of Professor Vögel of Germany, and several others, notably Mr. Ives, of Philadelphia, have brought this question prominently before the public. One step at least has been advanced by the introduction of the orthochromatic dry plates, the invention of which is ascribed to Dr. Vögel. This photographic chemist has gone further even than that, by sensitizing photographic plates and screening them during exposure in such a manner that the separate elementary colours or primary colours of nature are photographed on separate negatives. From such negatives, by use



in the lantern or the collotype process, the original picture can be built up in colour. Much yet has to be discovered in this process to make it really practical and of a commercial value; but as things nowadays progress so rapidly we may live in hopes of an early realisation, and we hail with delight the experiments tending towards this desired end. This is but one of the recent wonders of photography, and in glancing around it is seen that photography is gradually becoming the key whereby every physical feature can be most closely examined.

Photographs are now largely taken of the stars, which not only assists the astronomical student, but has already been the means of revealing many stars hitherto unknown.

In engraving the camera plays its part. The photogravure process, which requires the most delicate manipulation and is very difficult to any but the most experienced, has become the highest branch of photography for mechanical process production; and the results are by far the most beautiful of any yet applied to the engraver's art.

The half-tone process, too, is well known in book illustration. Some magazines depend entirely upon this class of picture for their illustrations. Undoubtedly there are many excellent half-tone pictures which have not suffered by their translation through the fine cross-line screen, and are even regarded by many as more effective and artistic productions than the originals.

The one point which strikes the reader in this age of pictorial journalism, is the vast change which has come over the methods of picturing current events. Look back upon the great woodcut era of journal engraving and the war pictures by special artists on the spot. Compare them with the true half-tone process blocks produced every day in the year, and we cannot but regret that all these beautiful effects were not accomplished in times when history was being punctuated with startling and bloody events, so that the scenes might have been handed down to us as they really appeared, and not as artists have imagined or wished them to appear.

**MAGNESIUM MATCHES FOR PHOTOGRAPHY.**—A photographic novelty, as described in the *St. Louis and Canadian Photographer*, is a wax match corded from the tip for about two-thirds of its length with a piece of fine magnesium wire. A box of these "magnesium" vestas is to form a part of the outfit of the detective camerist. The amount of magnesium in the matches is, of course, to be graduated in accordance with the sensitiveness of the plates in connection with which they are to be employed.

**PAINTER**—"Then, sir, you wish me to compose some ancestral portraits for your new country seat? How many ancestors would you like?"

**WEALTHY MERCHANT**—"Oh, you can make about eight to start with. If I like 'em I'll order another lot."

**LEARNING** the extent of one's ignorance is the first step in intellectual advancement.

## The Maturing of Paper.

PATENT DRYING MACHINE (No. 19588). THE "PERFECTUM."




NO one knows better than the chromo-lithographic printer of the trouble experienced in using old, new, or any other kind of paper, and he will greet as a blessing any contrivance by which the difficulties are even partially removed. In ordinary practice, however carefully paper is exposed to the atmosphere of the room, yet during printing the moisture on the stone is absorbed by the paper. The paper is simply vegetable fibres, composed of a material closely allied to starch. Such a material is spongy, and the moisture increases its sponginess. When, therefore, it is run through the machine a few times, the stretching strain which has been put upon it, together with the soft "giving" nature of the paper itself, must result in the paper being stretched longer than it originally was.

Numerous methods have been tried to assist in maturing the paper against these difficulties, but they are more or less unsatisfactory. The paper has been hung by clips, from hooks or lines in the printing room. It has been hung over lines. It has been placed on racks. It has been shrunk in hot rooms. These methods involve waste of space, waste of time, and waste of labour. More especially is this the case with many firms who habitually neglect to order paper for their work until the first stone is ready for machine, and then have to use new or "green" paper. Green paper is really the worst anyone can use, and unless there is a ready and rapid means of maturing it the whole order is a failure, or becomes a loss through the bad economy of the foregoing methods of drying, etc. It is here where the "Perfectum" maturing machine comes to the rescue. This machine is small, and will run at any speed from fifty reams a day.

The block shewn in Mr. Jennings's announcement on another page explains at a glance the simplicity of its construction and the impossibility of its getting out of order. It can be driven by a one inch strap from the shafting without a pulley, and does not require any skilled attention. Its principle is the introduction of heat into the drying. The heat can be regulated to suit the weather and any class of paper in use, and it will turn out a sufficient supply to keep six machines constantly going. It is self-delivering, only requiring a girl to feed it.

It must not be supposed that when paper has been once matured it is right for the whole order of printings. That is a condition which no one would expect, as at present the paper should be dried after each printing, and it enters the machine at each printing exactly the same size as when originally put in. The saving is in the rapidity and certainty with which the machine does its work. The inventor, Mr. J. P. Jennings, of Liverpool, has had forty years' experience in the trade, and we understand that he has granted the sole and exclusive license for manufacturing and selling his machine to the Victory Web Printing Machine Company, of Spekeland-street, Liverpool, to whom all communications should in future be addressed.

## The Birth of a Bank Note.

 NOT one in a hundred of the passers-by in Fleet-street knows that the old house at 69, built immediately after the great fire of London, is the headquarters of the famous firm of bank-note printers, Messrs. Perkins, Bacon & Co. There is no appearance of wealth about the outside of the place, which is as commonplace as any other house in Fleet-street, but from here the promises to pay of governments and wealthy corporations, exquisitely printed on the strongest and most beautiful of paper, are turned out by the thousand. The company, for it is a limited concern nowadays, lately gave us a chance of examining some of their choicest productions, but if we went with any felonious intentions (and we are not clear on this point) we were baulked at the outset, for each specimen we saw had three little round holes drilled into it, which made it, in one more sense, what the French call an *objet d'art*. We regretted these three round holes, for a few moments' calculation told us that we were gazing at a competency, and we are strong and active and have no principles worth talking about. These works of art are all going, or have gone, to Chicago, and will certainly be a *clou* of the exhibition. The holes will raise exactly the same feeling of regret in the Yankee breast that they have in ours.

Messrs. Perkins, as we have seen, smile at the burglar in drilling their specimens with vacuums; when it is a question of protecting the genuine business note from fraud, they depend, in a great measure, on the wonderful skill of their printers, and on the ingenious processes they have at their command. A good many people still think that the chief protection of a bank note is its watermark. This is not so; not even in the case of Bank of England paper, the plainest of all notes and bearing the most ornate of watermarks. The bank rely a little on the watermark, a little on the three deckle edges of the note, but still more on the perfection of paper used. To trust to the watermark alone would be leaning upon a broken reed, for it is easy enough to imitate. The Bank of England could, doubtless, tell its own paper anywhere, and Messrs. Portal have secret processes of their own, but it must not be supposed that the Whitechurch firm are the only people that can make bank-note paper. "Contrariwise," as one of Lewis Carroll's characters is fond of remarking. There are, at least, a dozen gentlemen with vats who will back themselves to make as strong and as beautiful a flimsy as was ever turned out from the Laverstock Mills, and the paper used at 69 Fleet-street comes from Messrs. T. H. Saunders & Co., of Darenth, and Messrs. J. B. Green and Son, of Maidstone.

The firm print annually promises to pay many millions sterling, and are responsible for every one of them, the notes we mean, not the promises. Therefore, the sheets are checked from hand to hand a dozen times over, and when the loss of a note does occur, which is rare indeed, it is a Black Friday at

69, and a day of wrath and fines. The original Perkins, he wrote Jacob before this honoured cognomen, was an American, who arrived in 1819 with the express intention of competing for the Bank of England contract. He did not get it, however, and revenged himself by starting the present business, and shewing the governors and company and Abraham Newland that he could "go one better." He invented a mystery, which is spoken of with bated breath among printers as the hardened steel-plate process. Nobody outside the firm knows the exact formula of the enchantment, nor is anyone likely to surprise the secret. The hardened plate produces an exact facsimile even to the finest lines, and a hundred years or so to one of these clichés is as a day. A million sheets of postage stamps have been printed from a plate without any appreciable wear being apparent. Besides this process, the company employs one of the greatest possible safeguards against imitation, and that is the engagement of the best possible artists, who engrave from them the beautiful portraits, or landscapes, that appear on the notes. Finally, when the note is finished, it receives a protective colouring, which secures it against any insidious attack by the camera.

But when the printing is an accomplished fact, the trouble is by no means over. The note must be dried, pressed, rolled, examined, trimmed, numbered in duplicate, stitched into books, checked, and finally packed in tin-lined cases for deposit in the bullion room of a mail steamer for transmission abroad. When it is the question of a Government note, there are a few other ceremonies which the mortals approaching it have to undergo. In the factory is a big fire-proof safe, and the keys of this safe are in the pocket of the officer of the agent-general of the Government. When they have an order in hand at 69, the officer arrives in the morning and gives out the printing plates and the paper to the printers, locking the plates up again at the close of the day's work. As for the artistic beauty of the notes turned out by the company, we are not going to try to dilate upon it. The missing word competition ran us clean out of adjectives.—*Paper Record*.

POSTERS WANTED.—There are nowadays a great number of ways in which fairly competent black-and-white artists can earn money, but I do not think that the general body of them—in the provinces, at least—know what an immense amount of outside work is taken by the great lithographic printing firms who go in largely for supplying tradesmen's pictorial hand-bills and posters. In most cases these firms do not ask for finished drawings. They buy and pay for at once rough designs conveying a good idea, and this is especially the case in regard to posters, where they get the outside people who regularly send in to them to think out ideas under various tradesman-like heads, such as watches, perambulators, corsets, and so on. A friend of the writer only the other day roughed out on pieces of cardboard a few inches square about a dozen sketches—mere ideas—for posters, sent them to a firm that he had had no dealings with before, and had two-thirds of them accepted at seven shillings and sixpence each.—*Answers*.





VIOLET 0640 at 5/6 per lb.

MYRTLE LAKE  
0686 at 5/6 per lb.

GERANIUM LAKE 0552 at 10/6 per lb.

ART BROWN 0962 at 4/- per lb.

SAFFRON 0953 at 5/- per lb.

ANTWERP BLUE 0718 at 5/6 per lb.

WINE RED 0964 at 5/6 per lb.

Printing Inks









BY CHARLES HARRAP.

## CHAPTER VIII.

## OILS AND VARNISH.

**I**N treating the subject of varnish, it is impossible to overlook the material from which the varnish is prepared; and, further, a general survey of the nature and characteristics of oils will open out a field of investigation to the intelligent, which may result in further advances than those briefly sketched in chapter VII. Oils embrace a large number of greasy matters, formed in most animal and vegetable organisms, and found in the earth as mineral oils. Oils are known under the names of hard solid wax, semi-solid tallow and fat, viscid fluid oils, odorous essential oils, and the solid, fluid, and volatile hydrocarbons of nature, or manufactured by distillation of natural products.

In considering oils, those of most importance as regards the preparation of varnish are the fixed oils—oils which are neither essences (such as turpentine, carraway, cloves, lemon, or bergamot) nor volatile. These fixed oils have a very close chemical similarity, although outwardly they vary considerably. The commercial oils are obtained from a limited number of sources, although there are many others equally available. Such oils are generally a brownish yellow, with a characteristic taste and slight odour; whilst really pure oil can be produced which is practically neutral, being devoid of colour, taste, smell, and physiological influence. When the latter does exist, it is due to secondary matters or impurities. Most fixed oils are liquid at the ordinary temperature, excepting palm oil, cocoa butter, and Chinese tallow. Animal fats are, of course, usually solid, except those from marine animals and the neatsfoot oil. Oils vary in consistency according to the proportion of olein which they contain, as compared with the proportions of stearin and palmitin present. In an ordinary way the consistency of oil can be compared with water by allowing them to run through tubes of the same calibre from vessels of the same capacity, and noting the time required for equal quantities to pass through. By such experiments it has been proved that castor oil is about two hundred times thicker than water; olive oil about twenty times, and linseed and hemp oils—the thinnest oils—about ten times thicker than water.

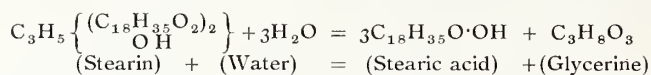
It is well known that oils are insoluble in water; they may be mixed in water, but do not become soluble. Croton oil and castor oil are the only two which are soluble in cold alcohol; but most oils are partially soluble in boiling alcohol; and all are readily soluble in ether, bisulphide of carbon, chloroform, benzole, and light petroleum spirit. By long exposure to air, most oils go rancid by the development of free fatty acids, but the oils containing linoleic acid (linseed oil), by exposure, absorb oxygen and harden into a tough, translucent, caoutchouc-like mass. This absorption is so rapid in some cases that a heap of oily cotton waste has been known to break out into spontaneous combustion. The non-drying oils, too, decompose by exposure. Their fixed fatty acids become converted into volatile fatty acids with a disagreeable odour. The comparative weight for bulk between water and oil always shews oil to be lighter than water. Taking the specific gravity of water as 1, then the lightest oil, cocoa butter, is .9, and the heaviest, castor oil, is .97. Oils become larger by heating than water does. Thus, whale oil increases for every increase of 1°C. by 1 volume in 1,000; rape oil .89 volumes in 1,000; and olive oil .83. In heating fats they melt, but it is curious to note that when melted they remain liquid to a much lower temperature than that at which they were melted before re-solidifying. Oils freeze at very different temperatures. Thus, olive oil freezes at 2° to 4°C. (higher than the freezing point of water—0°C.), and hemp, nut, and linseed oils do not freeze until the temperature has gone down 27° or 28°C. below the freezing point of water.

When oils are heated to 280° or 300°C. (three times the heat of boiling water), and when fats are heated to 300° or 325°C., they undergo a destructive distillation which breaks them up into richly inflammable gases, and into a peculiarly irritating acid vapour, known as acrolein. Chemically, oils consist of carbon, hydrogen, and oxygen, the proportions varying to make the different oils. Thus:—

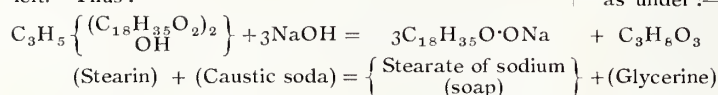
The proportion of carbon varies from 76 to 80 per cent.				
"	"	hydrogen	"	11 " 13 "
"	"	oxygen	"	10 " 12 "

These elements are compounded in the oils in the form of a fatty acid and glycerine, forming a glyceride of the fatty acid. These glycerides of fatty acids are generally stearin, palmitin, and olein; and no natural fat contains one only of them, but usually three and more in combination. These glycerides of the fatty acids are similar to ethers in their chemical relations, and they are known as the simple fats. The three simple fats—olein, stearin, and palmitin—are the most common; the next in importance being linolein (linoleic acid and glycerine) and physetolein (physetoleic acid and glycerine), the former found in linseed and other drying oils, the latter being the characteristic of fish and marine mammal oils.

In order that the real character of fat may be more thoroughly understood, the following actions are worthy of consideration. Thus, if oil be heated with steam at a pressure of 10 to 12 atmospheres, or with water super-heated to about 210°C., the oil is decomposed into its constituents as shewn in this equation:—



And carrying the chemistry one step further, the formation of soap, as well as its constitution, can be readily gleaned. When a simple fat is treated with an alkali, soap is formed, and glycerine (which for some years was cast away as a waste product) is left. Thus:—



It has already been stated that the three commonest fats are olein, stearin, and palmitin, to which were added linolein and phytetolein. To avoid any misconception on this point, it is as well here to point out the whole list of simple fats, arranged in distinct series; it being understood that for simplicity the name and formula of the acid is given, which with glycerine forms the fat in the substances named.

TABLE OF FATS DISTINGUISHED BY THE FATTY ACID.

STEARIC SERIES.			
Name of Fatty Acid.	Chemical Formula.	Substances in which it is found.	
Formic acid	... $\text{CH}_2\text{O}_2$ ...	Ants; turpentine.	
Acetic	... $\text{C}_2\text{H}_4\text{O}_2$ ...	Butter fat.	
Propionic	... $\text{C}_3\text{H}_6\text{O}_2$ ...	{ Amber oil and cocoanut milk.	
Butyric	... $\text{C}_4\text{H}_8\text{O}_2$ ...	Butter fat.	
Pentyllic	... $\text{C}_5\text{H}_{10}\text{O}_2$ ...	... ..	
Caproic	... $\text{C}_6\text{H}_{12}\text{O}_2$ ...	{ Cocoanut oil and butter fat.	
Heptylic	... $\text{C}_7\text{H}_{14}\text{O}_2$ ...	Castor oil.	
Caprylic	... $\text{C}_8\text{H}_{16}\text{O}_2$ ...	{ Cocoanut oil and butter fat.	
Nonylic	... $\text{C}_9\text{H}_{18}\text{O}_2$ ...	... ..	
Capric	... $\text{C}_{10}\text{H}_{20}\text{O}_2$ ...	{ Cocoanut oil and butter fat.	
Lauric	... $\text{C}_{12}\text{H}_{24}\text{O}_2$ ...	{ Cocoanut oil and bayberry oil.	
Myristic	... $\text{C}_{14}\text{H}_{28}\text{O}_2$ ...	{ Oil of mace and other spices.	
Palmitic	... $\text{C}_{16}\text{H}_{32}\text{O}_2$ ...	Palm oil, lard, etc.	
Margaric	... $\text{C}_{17}\text{H}_{34}\text{O}_2$ ...	Animal fats (pig's).	
Stearic	... $\text{C}_{18}\text{H}_{36}\text{O}_2$ ...	{ Tallow, including suets.	
Arachidic	... $\text{C}_{20}\text{H}_{40}\text{O}_2$ ...	Groundnut oil.	
Behenic	... $\text{C}_{22}\text{H}_{44}\text{O}_2$ ...	Ben oil.	
Cerotic	... $\text{C}_{27}\text{H}_{54}\text{O}_2$ ...	Beeswax.	
Melissic	... $\text{C}_{30}\text{H}_{60}\text{O}_2$ ...	"	

## OLEIC SERIES.

Crotonic acid	... $\text{C}_4\text{H}_6\text{O}_2$ ...	Croton oil.
Hypogæic or Phytetoleic acid	... $\text{C}_{16}\text{H}_{30}\text{O}_2$ ...	{ Earthnut and whale oil.
Oleic acid		{ Most fluid oils and fats.
Brassic acid	... $\text{C}_{22}\text{H}_{42}\text{O}_2$ ...	{ Rape and mustard oils.

## CASTOR OIL SERIES.

Ricinoleic acid	... $\text{C}_{18}\text{H}_{34}\text{O}_3$ ...	{ Chief product in saponification of castor oil.
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## DRYING OIL SERIES.

Linoleic acid	... $\text{C}_{16}\text{H}_{28}\text{O}_2$ ...	{ Linseed and other drying oils.
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Although it has been pointed out throughout this article that wax is a fat, and that fat consists of a fatty acid and glycerine, yet true wax is devoid of glycerine. The spermaceti wax, from the head of the sperm whale, is a complex compound known as cetyl palmitate.

From these remarks it is comparatively simple to classify oils into the two groups, with sub-sections, as under:—

## I. Fluid oils.

- (a) Non-drying or greasy oils (containing mostly olein).  
(b) Drying oils (containing linolein).  
(c) Fish or train oil (containing phytetolein).

## II. Fats and waxes—

- (d) Solid glycerides (containing mostly palmitin and stearin).  
(e) Non-glycerides of true wax (devoid of glycerine).

Of these—section (b), group I.—drying oils are the most important; and to further show the wide range of drying oils, the following table is appended, giving a list of the drying oils, the first ten being the most plentiful and most commonly used.

## DRYING OILS.

Oil.	General uses of oil.	
1. Linseed	For paint;	varnish; linoleum.
2. Hemp	"	varnish; lubricant.
3. Candelnut	paint; soap;	burning.
4. Poppy	" paint; soap;	food.
5. Sunflower	" paint; soap;	food.
6. Nut	" oil painting;	food.
7. German Sesame	" soap;	burning.
8. Niger	" soap;	lubricant.
9. Madia	" soap;	lubricant; burning.
10. Safflower	"	food; burning.
11. Wood	paint; varnish.	
12. Grape seed	soap; food;	burning.
13. Pumpkin seed		
14. Cress seed.		
15. Weld seed.		
16. Tobacco seed.		
17. Red pine seed.		
18. Pine tree.		
19. Koeme.		
20. Belladonna.		
21. Mexican poppy.		

From this list of drying oils it is readily seen that for making printers' varnish there are more oils than linseed which can be used. Thus, hemp, candelnut, poppy, sunflower, and nut (*juglans regia*), as well as the less common wood oil (*aleurites cordata*), all possess the qualifications necessary for a vehicle of heavy pigments. Linseed oil has, however, gained great popularity, and nothing short of a great financial gain would induce makers to adopt another.

Linseed oil is derived from the seeds of the linen plant by pressure, the residue forming the oil cake of commerce. These seeds contain only 32 per cent. of fat and oil, the remaining 68 per cent. consisting of albuminous matter (30 per cent.), water, mineral matter, and ash. In the outer layers of the seeds considerable quantities of mucilaginous matter exist. Thus, when one ounce of linseed is boiled in sixteen ounces of water, the jelly can be drawn in threads. The ash constituents of linseed seed are phosphates and carbonates of lime, potash, and iron. The linseed oil consists of the glycerides of linoleic acid, palmitic acid, and stearic acid, with other simple fats (probably olein) of a non-drying nature; but at least 90 per cent.



of the oil is linolein. This oil dries by oxidation into a resinous or caoutchouc-like mass, having an elasticity which fits it for printing purposes. It is a pale yellow oil, not disagreeable to taste; but the commercial oil (pure Baltic linseed oil) has generally a sharp penetrating taste and smell. Whatever may cause these properties, it is necessary, before making it into varnish, to allow it to stand some two or three years to mellow. Although linseed contains 32 per cent. of fat and oil, the actual amount obtained varies from 18 to 27 per cent. of the whole mass. Linseed oil remains liquid at a much lower temperature than is reached in this country; and it is not until the low point of 20° to 27°C. is reached that it freezes. This brief description of the oil shews that in its natural state it is scarcely the medium for some pigments. It is a drying oil, and if used in small quantities only, with can inks, cannot prevent drying. On the contrary, the oil will bind the pigment to a certain extent, it will dry into the paper, and ultimately will itself dry into a tenacious film. But by boiling and burning, this oil can be considerably improved. Linseed oil boiled down to lose one-sixth of its weight, becomes the basis of printers' and painters' varnishes. After the boiling it requires burning to alter its consistency; and the objects of burning linseed oil are:—

1. To get rid of the palmitin, stearin, olein, or other non-drying greasy matters. To burn out any refuse matter, or any mucilaginous matter not absolutely part of the oil.

2. To prepare a vehicle of sufficient consistency to hold the pigments in suspension, and to dry with the pigment on the surface of the paper, rather than to dry into the paper and leave the pigment in a dust easily rubbed off.

3. To prepare a vehicle to dry on the paper as is necessary for bronzing and enamels.

4. To obtain different thicknesses of varnish capable of conveying the different weights of different pigments, and to counterbalance the drying qualities of different pigments.

The practice of burning the oil is naturally a risky one, and to avoid it some manufacturers thicken the oil by adding resin. Such a course is wrong, for it introduces a brittle element into the varnish, tending to ruin all its good qualities. Others adulterate the oil with cotton seed oil, or resin oil.

In commenting on the semi-state ceremony at the opening of the Imperial Institute, the *Leeds Daily News* says: "the Princess May, who looked shy, was of course there, and her dress still puzzles the papers, which express the following opinions on its colour and make:—

*Times*: Heliotrope. *Daily Telegraph*: White satin, striped with pale mauve and brocaded in a pretty design in white. *Daily News*: Mauve. *Daily Chronicle*: Peach colour. *Morning*: Heliotrope and white silk. *Daily Graphic*: Pale mauve. The lady journalists give peach colour."

However well the sense of colour may have been cultivated, this shews that a common standard of colours does not exist even in people of normal vision, and one of the first acts of the Imperial Institute might profitably be the construction of a national standard of colours.

## The Holbein Society's Publications.

PHOTO-LITHOGRAPHY TO THE FRONT.



THE work undertaken by the Holbein Society is of such a nature as to be only of direct interest to antiquarians and lovers of old books. On the point of actual utility opinions differ, and it is not intended to discuss the point. The society has been in existence since 1869, and has published eighteen volumes, the last of which has been issued recently. These volumes are copies, by photo-lithography, of rare old books, books which, at the present time, are so rare that only one or two copies are in existence. The beauties of these works have hitherto been enjoyed only by the few, and even now only about 120 copies have been made for the society. These volumes are mostly in Latin, and were originally produced from the earliest type. They are embellished by hand work and illustrated by wood engravings. Many of the latter are not only amusing, but awaken a keen interest in the book illustration of the past.

The society has spared no expense in reproducing the books. They have been printed on German and other hand-made papers, and on machine-made papers as nearly imitating the originals as possible. Some of the volumes are as thick as the old family Bibles, but much longer. Such a one is the fifteenth volume, "Tewrdannekh," an allegorical poem of Knight Errantry, by Melchior Pfintzing, the subject being the adventures of Emperor Maximilian in his wooing and winning of Mary of Burgundy, published in 1519. The copy is a splendid production and well worth a close perusal. Another work, which is probably about as small as any they have issued, is the seventeenth volume, "Pronosticatio," originally published in 1488. Not only is the work an excellent photo-lithographic production, but the plates have been coloured up by hand and machine in facsimile.

Coming down to the eighteenth volume, originally published in 1553, entitled, "A Catechism for the People, Pastor, and Preacher," by D. Mart. Luther, we arrive at the last production of the Society, which displays the excellence with which photo-lithography can reproduce these intricate masterpieces. The publishing of this work, as well as most of the previous ones, has been entrusted to Mr. A. Brothers, of St. Ann's-square, Manchester. The letterpress is in old German, and the severest critic cannot find fault with the sharpness and clearness of its pages. All through the book are numerous half-page illustrations from the original impressions, showing that no pains have been spared to obtain clear and accurate copies. Taken altogether, it is a work which the photo-lithographer may well be proud of.

Although photography is trenching closely on lithography, and apparently sharing a large amount of the profits hitherto enjoyed by lithographers alone, yet here is an instance in which the work could not have been done without photography. It is a case in which photography has increased the lithographic business rather than stood in its way. It is only another instance demonstrating that the cheaper work can be done the better it is for trade in general.

# What is Colour?

## CHAPTER VIII.

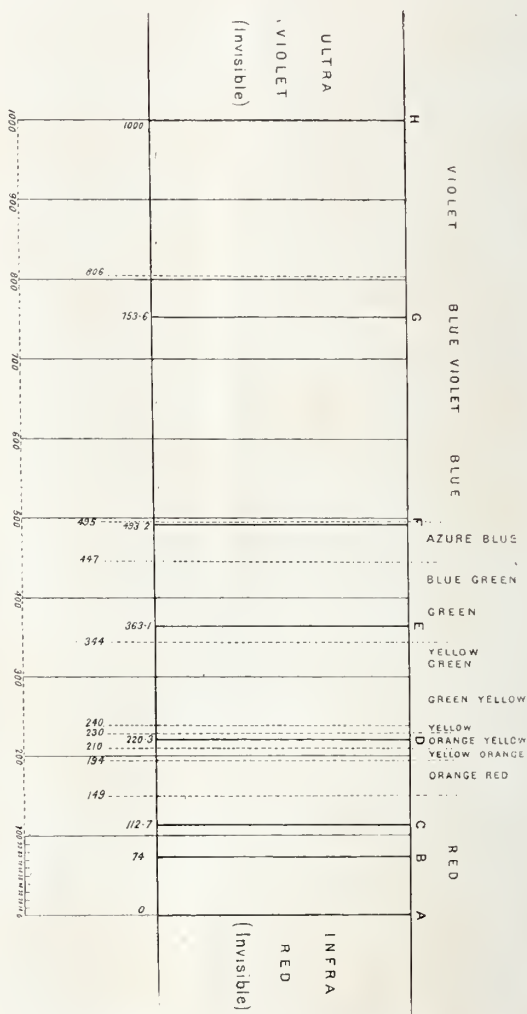
### COMPLEMENTARY COLOURS.

**T**HE term complementary colour is probably somewhat vague, and to convey the fulness of its meaning it is necessary to revert to matters already dealt with, especially in chapter VII. as illustrated in fig. 1. All colour has its origin in the white light of the atmosphere derived primarily from the sun, and the colour of a body depends upon the number of the component parts of white light which such a body is able to reflect direct to the eye of the observer. Bodies have very different capacities of reflection, and are, therefore, of different colour aspect. That portion of white light which is absorbed, or irregularly reflected, is not received by the eye, and takes very little part in the apparent colour of the body. It is *that* part of the white light which is the complementary of the apparent

colour of the body and thus a body appears to be of a decided red colour, the remaining constituents of white light, viz., the yellow and blue, being absorbed. These two colours when combined as pigments give a green reflection, and green would be considered the complement of red. The definition of a complementary colour may also be stated as that colour which, when combined with the original colour (which are reciprocally complementary), will give white light. In a similar way any portion of the spectrum can be chosen, and its equivalent pigments compounded; the resultant compound colour has as its complementary the colour produced by compounding the pigment equivalents of the remainder of the spectrum. "It is obvious," says A. H. Church, M.A., "that an immense number of such complementaries must exist. Their study is of great importance to artists, especially to workers in the so-called decorative or ornamental arts, for a knowledge of the strength of contrast in colour depends upon a right appreciation of the true complementaries."

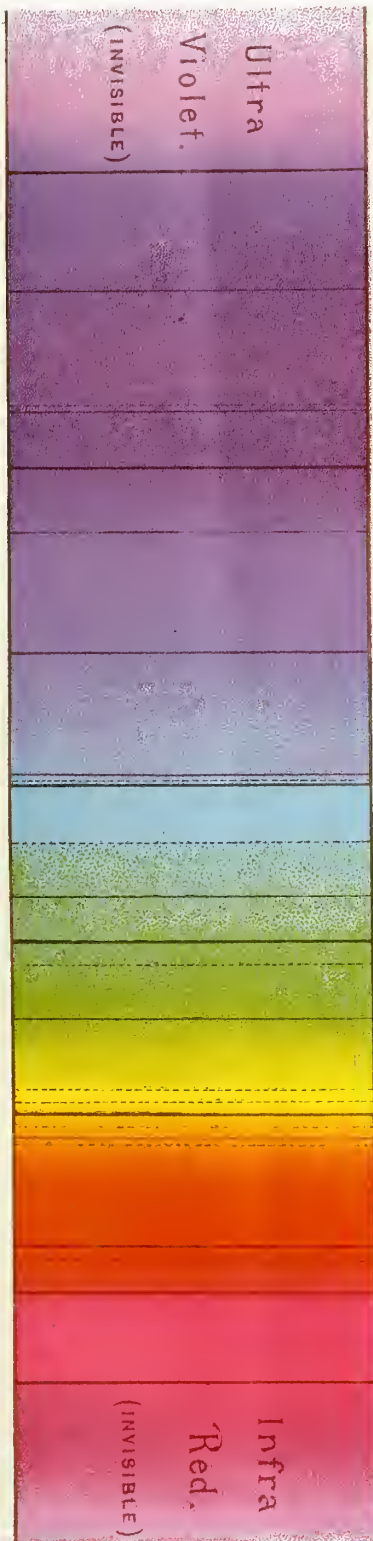
To prevent the reader being led to think that this term "complementary" is in any way analogous to "complimentary" or harmonious, it is better to state here that the system of naming "complementaries" is an arbitrary one based on the structure of white light, whilst harmonies are usually based on much better selection by taste, and on a much narrower divergence of colouring. Good harmonies arise not by using the whole of the spectrum hues, but by a judicious selection from those colours, governed by a certain amount of rule, arising from the physical character of light and its synchronous bearing upon the eye of man.

The term complementary colour has some interesting practical applications which of late years have been used by well-known advertisers. Although not entering into the theory of the matter, these public illustrations have brought the phenomena into popular acquaintance, and very few are prepared to doubt the capacity of the human eye to see that which does not exist as an outward exciting cause of sensation. The advertisements



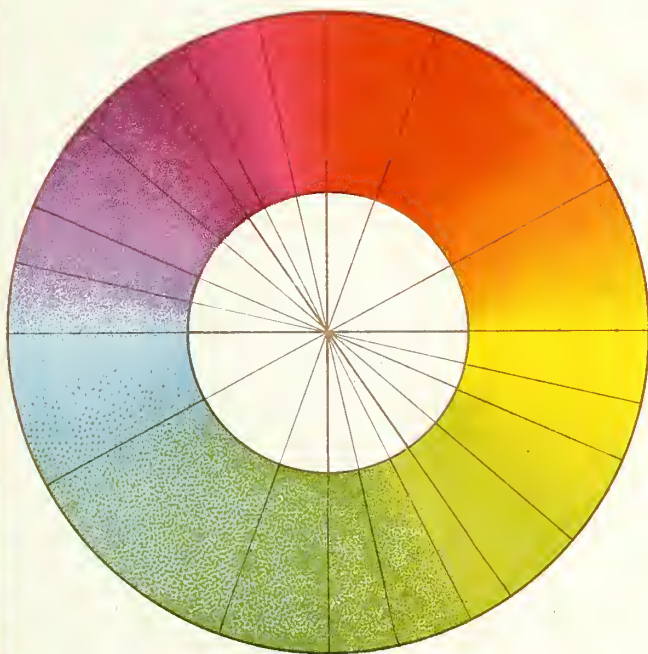
The coloured illustrative diagram accompanying this article has already been constantly referred to, and more especially so in chapter VII. (in No. 10 of this journal) when skeleton diagrams in black were given, shewing the exact character of the present coloured ones. To render them the more readily intelligible the black keys are again printed here and can be used as a reference. The spectrum band is divided up by the solid lines (Frauenhöfer's) and by dotted lines. The latter are the limits of each succeeding colour, the names of which can be read off from the top of the black diagram, fig. 2. The circular colour chart or spectrum band is arranged, first with a view to keeping the same proportion of each colour present and to merge them from one into the other to make a circular chart of continuous colour, and secondly to shew at once, along each diameter, the complementary colour combinations. See fig. 1.





# Spectrum Analysis of White Light.

AND



Diagrammatic Chart  
SHEWING  
*all gradations of colour in the*  
SPECTRUM of WHITE LIGHT.  
*(arranged to shew complementaries.)*

DE MONTFORT PRESS LITHO.





referred to are the discs of flat colour with white lettering upon them, and a star above or below the disc surrounded by plenty of white paper. Sometimes the disc is blue, and the instructions therewith are to gaze steadily for half a minute or more on the coloured disc, then look steadily at the star. Gradually the original design of disc and lettering is seen in its complementary colour, orange. With a red disc the second experiment reveals the design in green, its complementary. The cause of these manifestations is at present a question of doubt. The theories which exist to explain them are worth a passing mention. Thus the retina (the nervous layer at the back of the eye, which conveys all the sensation of sight to the brain) may be considered as constituted of some eight distinct modifications of nervous fibres, each kind of fibre having its special office to fulfil in all sensations of sight. Some of these fibres may be wholly engaged in transmitting yellow light, others red, others blue, and others green. The absence of some of these fibres may be the cause of want of power in some people in discriminating certain colours, and known as colour blindness; whilst the use of all the fibres when present gives full activity in colour vision, and may be regarded as normal sight. All energy is liable to exhaustion. Muscular energy gets exhausted, and however strong the will may be to work, the muscles cannot comply. Our sensations of taste, smell, and touch become exhausted by perpetual use, and the energy is only restored by rest from their exercise. So it is with sight; the colour sensation becomes fatigued by constantly looking at coloured objects, such as paintings, etc. Therefore, whilst the colour sensation is in full activity, and the sight is directed to one colour only, those fibres engaged in transmitting that colour to the brain become exhausted. On closing the eyes the colour still persists for a few moments, then gradually losing its brightness, it gives place to the whole colour sensation produced by the remaining colours of the spectrum. This effect can be accentuated by turning the eye from a brilliantly coloured disc on to a white space. The exhausted fibres being no longer able to transmit their particular colour, the white surface appears to be coloured with the mixture of the other constituents of white light only. Thus, after gazing on a red disc the eye becomes fatigued, and when it looks on white paper, the blue and yellow mixed to form a bluish green give the white paper the hue of the complementary colour.

Colour sensation may also be due to the secretion of sensitive fluids in the retina of the eye. These sensitive fluids may resemble the sensitizing films on photographic plates; but it is better to conceive of them as existing in cells of the nerve matter and acting as transmitters of the colour sensation, and that the whole colour sensation is nothing more than a colour electricity. If, therefore, the transmission of one particular colour uses up these fluid transmitters, then when the eye views pure white light only the remaining colours of the spectrum will find a means of transmission, giving the complementary colour of that which originally exhausted the nervous fluid. Such a theory carries with it many other examples in the human body. In digestion, the fluids of the mouth,

mucous membrane, stomach, liver, and pancreas are all used up, and it takes as a rule three hours for their supply to be replenished by the ordinary secretions of the organs. With lower animals and vegetables similar actions take place. The stinging capacity of the jellyfish and other soft-bodied animals has its origin most probably in the production of formic acid, which when once used is exhausted temporarily. So with the sting of the nettle; the acid which stings is exhausted, until more is secreted, after each sting is inflicted. With the eye, however, the activity is much greater, and it requires only a few minutes after the above experiments to regain the fulness of colour sensation. In thus characterising colour sensation as electricity, some support is given to the theory by the experiments of Professor Dewar, who has shewn that when an eye is taken out and light acts upon it, there is a current of electricity passing through the nerves, of such strength as to move the electrical indicators on a lecturer's table to such an extent as to be perceptible by a large audience.

This digression has been made to give the reader a clearer idea of the nature of sight, and from it many deductions may be made which readily explain why there are such terms as harmony, contrast, and complementary colour.

In summing up these phenomena, a glance at fig. 1 will suffice to show how the complementary colours can be at once tabulated. Taking any colour there mentioned, it is only necessary to pass along the diameter of the circle, and at the other end is found the complementary colour. The complete tabulation is as follows:—

#### PAIRS OF COMPLEMENTARIES.

1 { Red Green blue	2 { Orange Greenish blue	3 { Orange yellow Turquoise
4 { Yellow Blue	5 { Greenish yellow Violet blue	6 { Green yellow Violet
7 { Yellowish green Purplish violet	8 { Green Purple	9 { Emerald green Reddish purple

Add to this the means of producing these colours from the tabulation of colours and pigments given in chapter VII., and the scheme is complete for all practical purposes.

### CHAPTER IX.

#### THE CLASSIFICATION OF COLOURS.

It has been shewn in the opening chapters, that all colour is a result of varying absorption and irregular reflection of the component waves of white light. Not only is the ultimate colour sensation affected by the colour of the light in which it is viewed, but it also depends upon the intensity of such light. Further, colour as seen in nature and decorative work is entirely dependent upon its surroundings, and it is that feature which makes a study of colour so important to both the landscape and decorative artist. It is in this phase of the subject that harmonies and contrasts become apparent, and can be studied in a manner which reveals the reasons as well as the practical conclusions arrived at for such colour sensations. At the outset, it should be understood that no colour sensation is imperative, it is simply relative.

No one person can from a single series of experiments lay down absolute rules. It is only from constant experiment under normal conditions that anything approaching accuracy can be determined; and after all, these conclusions may be upset by the inspection of the less trained eye, or a differently educated eye, or from the eye of a so-called colour-blind person, who very frequently can discriminate much finer differences in the shades of one colour than the normal eye. Thus it will be seen that to a large extent it is left with the readers to discriminate for themselves how far such conditions are met by their own eyesight.

Before directly entering upon the subject of juxtaposition of colours, it is as well to note that there is no standard nomenclature of colour. Each writer is at perfect liberty to call colours by whatever name he may use within reasonable limits.

As an example of the different ways in which colours can be designated, the quoting of a table of shades of one colour—purple—adopted by Mr. Ridgway, of America, and republished by Church, will shew that the floral world presents probably a closer link of shades than any other natural product. His set of colour names, as set forth for the use of naturalists, is:—

1 Prune.	8 Aster.	15 Wine-purple.
2 Dahlia.	9 Maroon.	16 Lavender.
3 Auricula.	10 Violet.	17 Solferino.
4 Plum.	11 Phlox.	18 Heliotrope.
5 Pansy.	12 Pomegranate.	19 Lilac.
6 Indian purple.	13 Mauve.	20 Rose.
7 Royal purple.	14 Magenta.	

However different opinions may be, there is little doubt that this series, starting with red-purples and finishing with blue-purples, is substantially accurate. It may be extended, although that is doubtful. The only way to improve it is to apply such names as can be considered scientific, rather than such objects as flowers, which change colour according to the soil and climate.

Again, Mr. Church cites an instance of naming colours from known natural objects, giving only the range of red and yellow:—

1 Chinese vermilion.	5 Saffron (dry).	9 Straw.
2 English „	6 Orange peel.	10 Gorse flower.
3 Orange „	7 Pure gold.	11 Lemon peel.
4 Red lead.	8 Amber.	12 Sulphur.

Here, again, the list is fairly complete; but to the artist and printer it would have been better to introduce the names of well-known pigments, such as orange chrome, sienna, ochre, yellow chromes, lemon chrome, Naples yellow, and cadmium yellow.

Reverting to other modes of classification, the category of blues formulated by Werner is worth inspection. He has used the following ten terms:—

1 Blackish blue.	5 Violet blue.	9 Lavender blue.
2 Indigo blue.	6 Prussian blue.	10 Sky-blue.
3 Duck blue.	7 Smalt blue.	
4 Plum blue.	8 Azure blue.	

In quoting this list from his work, the original arrangement has not been adhered to: the colours have been tabulated more in ascending order from broken to pure, and from pure to the lightest and greenish blue. It would here have been better to have introduced the well-known ultramarine and cobalt, and thus almost

completed the list of blues. This same writer, in 1774, grouped out the colours, and certainly made a basis on which later systems could very well have been built up.

How to obtain anything of an accurate nature cannot be arrived at immediately. It is necessary to have an international conference, and the adoption of international standards. These standards could be produced in encaustic enamel tablets, and preserved in the same way that the standards of weights and measures are kept in the walls of the House of Commons. There should be no difficulty in this, and the value of such a step would be too great to estimate. At present the extensive manufacturers of silk, satin, ribbon, cashmere, sewing silks, sewing and other cottons, threads, and cords; the stainers of paper, the makers of pigments, the pottery manufacturers, and all artists, both decorative, ideal, and real, are one and all open to use any colour they please, and call it by whatever name they please, within reasonable limits; whilst the mere attempt to match colours by name is almost beyond the realm of possibility.

Naturally, some will say, how can any rule be made whilst new colours are frequently introduced? Quite so; but they, too, could be determined, named, and fixed from time to time, and added to the list. Such a compilation would be at once copied in thousands, and distributed all over the world to art schools, public institutions and offices, and could be published for the use of manufacturers, etc. At present, some of the best schemes are made by private venture in the form of the shades of sewing silk and cotton, made by Messrs. Coates, Kerr, Clark, Chadwick, Lister, Wardle & Davenport, Briggs, and others, which might lead to a coalescence of the charts they use, and form a fair standard basis for colour users.

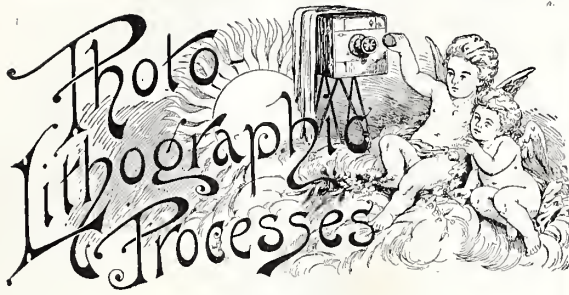
In the absence of such a standard, however, the writers on colour are compelled to confine themselves to the naming of colours from natural substances which vary little in shade, and to the colour circle already dealt with in chapter VII., which is to the colourist what the compass is to the mariner, the only real means of determining his direction of colour thought.

[To be continued.]

ALL those interested in any way in technical education, whether as members and officials of committees, as teachers, or as students, would do well to subscribe to *The Technical World*, a weekly journal of technical and secondary education. The first issue, just to hand, shows what is intended in the way of making the journal an intermediary between technical education committees and their friends and supporters. As a newspaper, with this object in view, it has come at a very opportune moment.

PHOTOGRAPHY AND THE FALSIFICATION OF DOCUMENTS.—It is stated that the Russian government has instituted a photographic laboratory in connection with the courts of justice, the principal object of which will be the verification of the authenticity of legal and other documents. The laboratory, it is further said, has already done signal service to the cause of justice in this way.





## CHAPTER XIII.

## THE DRYING BOX FOR COLLOTYPE FILMS.

**I**N preceding chapters we have repeatedly warned would-be operators that colotype printing is by no means as easy as it looks, and to attempt to work without proper appliances is simply to court failure. Let care, cleanliness, and accuracy be the guiding lines, and await patiently the result.

Colotype films must be properly dried, and to effect this the following simple drying box can be easily constructed in such a way as to effect the purpose. Both

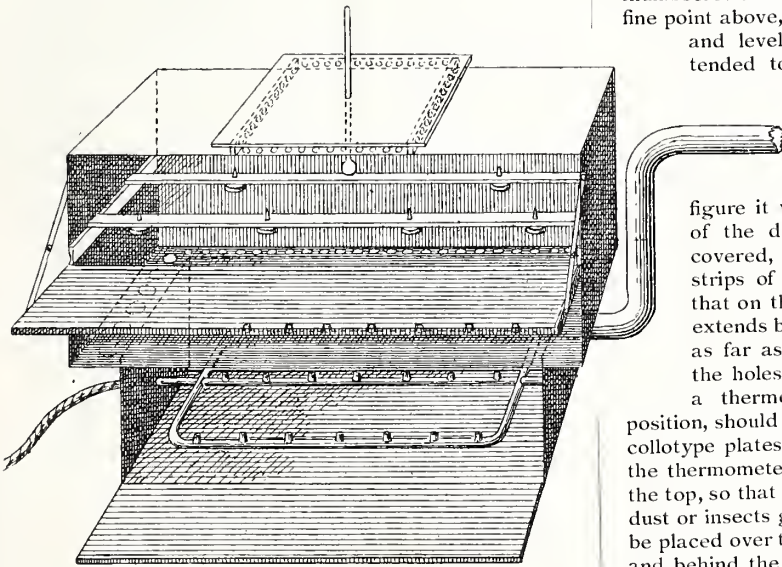


FIG. 3.  
ORDINARY COLLOTYPE FILM DRYING BOX.

the illustration and the description are the principles to be understood, and do not make the details at all imperative. The main point is to effect a drying and not a baking operation, therefore keep a careful watch that the ventilation is complete.

The heating arrangement consists of a framework of gas piping, fitted regularly with burners, and supported in a closed iron box having a large ventilating shaft, leading the foul products of combustion away from the drying box into the open air. The gas is

supplied by an india-rubber pipe connection, and the heating power should be entirely under control. The gas burners should be ordinary luminous ones, such as Bray's No. 1, rather than Bunsen burners. The latter would be too hot and not so closely under control as luminous burners. The iron box should have ventilating holes along its lower edge, and one of its sides should also form a door. Heating by gas is not indispensable, for oil stoves or lamps may be substituted.

Since the heat for drying need not exceed in any case 150°F. (50°C.), the top of the iron box containing the gas jets may be made of an iron tank containing water, as shewn (fig. 1) and described in chapter I. But it is customary to make the colotype drying box of a simple iron box, and place upon it a second box with an iron bottom. By inspection of fig. 3, the details of the upper box will be readily understood. The bottom is pierced around its outer portion with ventilating holes, and, being of iron, can be rested on the gas-stove box without fear of fire. The upper box is purposely larger to allow the ventilating holes to receive fresh air all round. The remainder of the upper box may be constructed of wood. One side is divided longitudinally, so that it consists of a door at its upper portion opening horizontally. Within, the sides are fitted with brackets to carry the crossbars. These crossbars are tapped, as shewn, to receive thumbscrews. These thumbscrews are brought to a fine point above, on which the glass plates are placed and levelled. The drying box shewn is intended to take two plates, one on each set of three levelling screws.

The top of the box consists of two rigid portions and a lid, which may be hinged upon the central raised portion of the top. In the figure it will be seen that one-third of the top of the drying box in the centre is left uncovered, and is walled around with narrow strips of wood perforated for ventilation, and that on these strips rests a lid, or cover, which extends beyond the perforated strips to prevent as far as possible any dust dropping through the holes. In the centre of the lid is inserted a thermometer, which, when in its proper position, should have its bulb nearly on a level with the colotype plates placed inside the box. The scale of the thermometer should be mostly outside the lid at the top, so that it may be read off. Finally, to prevent dust or insects getting into the box, fine gauze should be placed over the holes in the iron bottom of the box, and behind the holes in the top of the box supporting the lid. As both the gas heater and the bottom of the box are made of iron, there should be a very equal distribution of heat, but to assist this it is better to cover the iron bottom of the box, as far as possible, with a thick layer of sand.

Various methods will suggest themselves for carrying out the construction of these boxes, and may meet the purpose equally well. Thus the door of the box may be simply a frame covered with fine muslin, and the top also a frame similarly covered, to meet the requirements of ventilation. These arrangements might be made more effective by using two or three thicknesses

of muslin; but there is nothing to prevent the settling of dust, which will ultimately close the mesh of the muslin and creep through into the box. The door of the gas-heating box below must fit well, or the foul air will creep through and go up into the drying box. It would be better to have the door small, and omit ventilating holes above it, or even all along that side of the upper or drying box.

Another form which the drying box has assumed is that used by Mons. Thiel, of Paris. It is, perhaps, less easy of construction, except under special advantageous circumstances. The actual arrangement in Paris consists of a water-heating apparatus under the floor of the room, from which steam or hot water passes upwards and through a well-distributed series of parallel pipes lying in the bottom of the drying box,

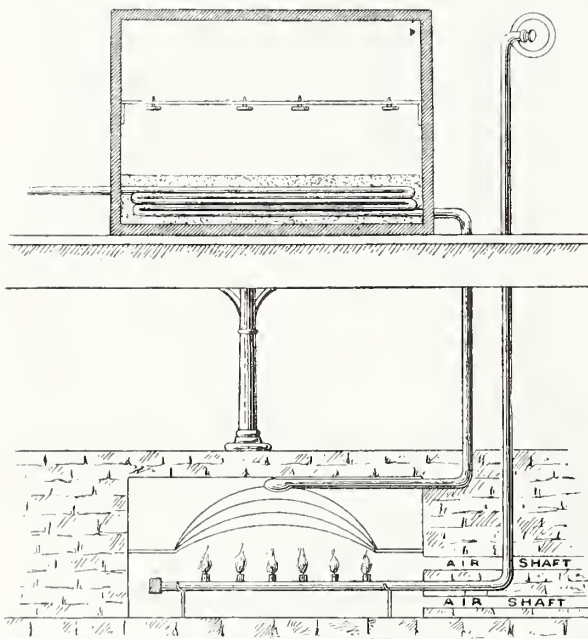


FIG. 4.

MONS. THIEL'S DRYING BOX FOR COLLOTYPE PLATES.

and covered entirely with sand, over which is placed a sheet or two of tissue paper, as illustrated in fig. 4. Higher in the box are the crossbars with thumbscrews for levelling the plates, fitted as already shewn in fig. 3, and indicated in section in fig. 4. The illustration shows in the main the arrangement as actually made, but there is no reason why the same principles could not be applied in a less expensive way. The underground boiler is unnecessary. Any boiler and coil of pipes will meet the requirements, and could be placed on the bench not far from the drying box, and always be under control. The drying box, however constructed, must be fairly accurate and capable of all applications. Its use is not confined solely to dry plates for collotype printing, but to dry them with various granulations on their surfaces, and for the preparation of collotype transfers for stone work.

It has been already shewn that much depends on proper drying. The whole film can be easily spoiled if dried incorrectly. The difference of only 20°F. (9°C.) of temperature makes itself most prominent. Thus a film dried at 110°F. (34°C.) possesses a close mealy grain, which could not be printed from polished stone; whilst when dried at 130°F. (43°C.) it assumes the mechanical stamp of the well-known Maclure and Macdonald's fine-grained chalk paper, which, with the greater experience of to-day, could be printed well from polished stone. This illustration gives a rough guide as to the actual temperature to dry at. It may be taken that 110°F. (34°C.) is a very good average, and the time for drying between half and three quarters of an hour. The drying box, too, is always brought into requisition in coating the collotype plates. After the substratum has been put on, the plates are dried in the box at temperatures varying as set forth in chapters X. and XI. Previous to coating with the sensitising film, the plates are levelled in the box, and warmed up to the proper temperature to receive the film. When coated, they are steadily put back in the box and dried, as described in chapter XII.

(To be continued.)

THE OFFICIAL CATALOGUE OF THE BRITISH SECTION OF THE CHICAGO EXHIBITION.—A consideration of the fact that this catalogue of the British Section fills 536 pages, together with 110 pages of advertisements, almost appalls one at the probable immensity of a complete catalogue embracing all nationalities. That portion relegated to photography is prefaced by a brief summary by Captain Abney, from which we learn that, as regards the application of photography to scientific purposes, it is believed Great Britain is very much on the same level as other countries. Its uses in medicine, chemistry, astronomy, physics, mineralogy, gunnery, and other branches of pure and applied science, has been very fully demonstrated at the various learned societies, where a very large proportion of contributions are illustrated more or less by photographs. He gives credit to the Eastman Company for having given impetus to flexible film photography, and the form of roller slide in which to use it. We are pleased to see that a large number of pictures are contributed by the photographers of the United Kingdom.

EMBOSSING FROM THE LITHOGRAPHIC STONE.—A lawsuit of considerable importance to the lithographic trade is pending in Glasgow and, unfortunately, has been postponed to a date which will make it impossible to have a report of it in the present issue. The litigation is to test the validity of a patent, taken within the last two years, to protect the method of embossing into high relief from a stone in the ordinary method of printing from a machine, having patches placed upon the cylinder to assist the relief.

*Furniture and Decoration*, the valuable publication of Messrs. Smith & Bathwright, makes up a capital April number, and is well illustrated.



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# Japanese Paper:

## Its Origin and Use.

[Specially translated for THE BRITISH LITHOGRAPHER from  
*Revue des Arts Graphiques.*]



ACCOUNTS differ as to the period in which this paper was introduced into Europe. Traces of it have been found as far back as the seventeenth century, and Rembrandt and a number of his pupils are known to have utilised it in obtaining im-

pressions of their work, it having probably been brought to their notice by some sea captain or retired Dutch merchant.

In England, at the end of the eighteenth century, Wm. Baillie, an artist and engraver, used it for his *aqua-forte* copies, and in France the copperplate printers made their first thorough use of this paper after the exhibition of 1857. At the beginning of the present century Chinese paper was much in vogue for this purpose, but being less resistant, and containing fragments of straw, was not properly suitable for proofing engravings or for anything claiming to be good work, so that when the Japanese paper became readily obtainable, it soon received the preference of amateurs and artists, to whom it recommended itself on account of the surface and the effects obtainable in light and shade during printing.

Japanese historians also appear ignorant of the exact period when this paper was first produced in their country. A legend says that under the rule of the Empress Suike, towards the middle of the sixth century, a Korean priest introduced new processes for the manufacture of paper, but this is somewhat doubtful, for the two kinds of paper differ materially, the one being made as with a machine, the other, on the contrary, being obtained by moulds.

In 1871, England, by the good services of consuls and diplomatic agents, was in possession of exact descriptions of the processes relative to the manufacture, cost, order of manufacture, and the numerous uses to which the special Japanese paper was put.

Four plants are used in the manufacture of Japanese paper, and these are the mulberry (*Edgeworthia papyrifera*), in Japanese *mitsu mata*, which indicates its useful qualities, the gampi (*Wikstrœmia canescens*), the tororo (*Hibiscus*), of which the root also is utilised in the manufacture, and lastly the best known, called in England the paper mulberry, and in Japan *Ma Kodza* or *Kozo* (*Broussonetia papyrifera*), which is in general cultivation throughout the country. This shrub belongs to the family of the *Artocapees*. It is reproduced by cuttings. In September the plant has attained a height of about three feet; it is cut in October, the remaining stem continually sending forth fresh shoots. The cuttings are steeped in water for a short time, dried, and again damped and scraped with a knife, removing the bark, which is used for the inferior qualities of paper only. The dry *liber* is washed in running water, kneaded, washed again and

exposed to the sun's rays until bleached almost white, after which it is boiled in a lye made from buckwheat, so as to dissolve gums and resin; the fibres are then separable. The operator cuts the knots with a knife, and with a mallet flattens out any excrescences. This pulp, which undergoes more or less of these processes according to the quality of the paper desired, is placed in tanks with the necessary quantity of water, to which is added a milky substance prepared from rice water and a gummy preparation obtained from the bark of the *Hydrangea paniculata* and the root of the *Hibiscus Menichol*.

Being informed of the favour this paper was receiving in Europe, the Government of Japan resolved to improve on the primitive methods of manufacture then in use, and re-arranged the process on the existing system. They formed an enormous establishment under the name of the Imperial Manufactory, and of which the productions defied competition, both as regards quality and quantity. Many desirable features of hand manufacture are still retained, thus preserving resistance and flexibility of the fibre and avoiding the breaking up which inevitably results in paper making by machinery. The large manufactory has proved unequal to the work of providing sufficient paper to meet both the demands of the State and the requirements of commerce, and a year ago a machine was introduced which manufactures the paper with much of the same degree of care as by the hand method. This new product prints equally well, though it is not so solid or resistant as the old mould process; also its price is much less.

The Japanese bestow a marvellous amount of care on their paper manufacture. This proceeds both from the minute and scrupulous details involved, and the conscientious use of methods and ideas which are handed down from one generation to another and jealously kept secret.

M. Regamey, who shows in his "Japon Pratique" a thorough knowledge of Japanese graphic arts, says that the Japanese are not provided with pens for writing nor crayons for designing, but use the brush in conjunction with Indian ink. During the middle ages, the *Thoshira*, or Archive department, had the exclusive privilege of manufacturing this ink. The manufacture remains to this day, but does not exist as a private industry. There are two processes employed: the one has for base vegetable charcoal, the other uses lampblack, the latter giving the best result. The vegetable black is obtained by burning resinous pine wood on the paved ground in a small structure divided into several compartments; the walls are covered with thick paper, on which the black is deposited. Lampblack is more costly, but preferable for use. To obtain this, place on a stand a large number of saucers containing oil of gama, or colza oil, and a lighted lamp; cover them with a cone-shaped vase, pierced at the top. The black should be collected very frequently, as it is apt to deteriorate in quality. To make the black in use at the present time water and boiled paste are mixed together, undergoing a most careful kneading and mixing. The pulpy mass is put into moulds and compressed. It is then put in damp ashes for four days, then in slightly

damp ashes, and at last about three days in dry ashes. It is afterwards washed in fresh water and polished. This ink improves with age.

with the art of design, and where such artistic designs and illustrated work is produced, as in Japan.

A pile composed of all the novels, educational works, accounts of travels, historical works, religious treatises, theatrical albums, etc, which have been accumulating for centuries in Japan, would surmount even the snowy summit of the Japanese Fusiyama.

Fixed types being unknown, it was necessary to engrave in relief all the contents of these books; the reading matter and illustrations were traced by the brush on transparent paper, very slight in texture, and fastened reverse side on to the wood, but in this process the engraver's tool caught in the grain of the wood in passing. This method suggested to the artist the need of designing by reversing directly on to the wood, just as artists

worked before the utilisation of photography on wood. The engraver, squatting on the ground, has a small bench as a work table, under which his folded-up legs adapt themselves. He holds his tool in the right hand and directs the blade by the use of the left hand. The sitting posture would be simply intolerable to any but the Japanese, but among



BRUSHES.

It is generally admitted that the special brushes were invented about the same period as the paper. At first they were made from hair obtained from deer and rabbits, and the name of the first maker still survives: Kohoski. Using the ashes formed by burning rice husks, the worker rubs it between his hand with small quantities of the hair intended for use, and which has been well separated and cleaned. It is then assorted and polished with a fine copper comb.

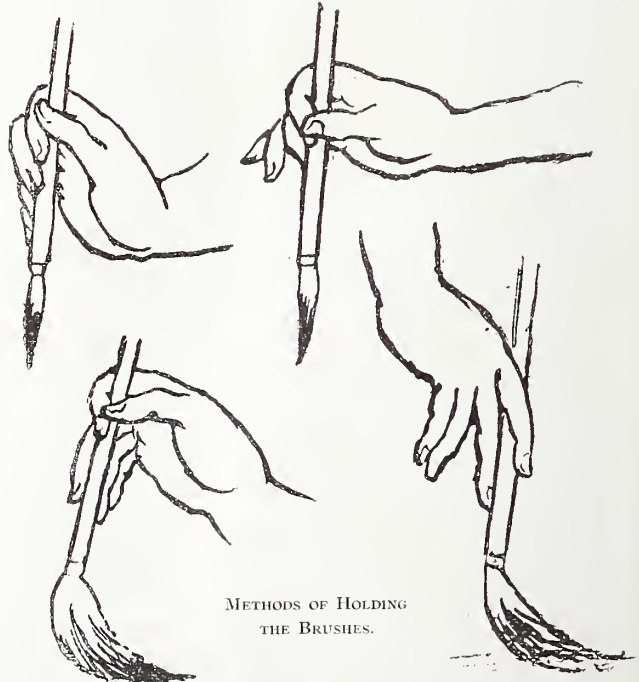
According to the dimensions or the quality of the brushes required, a layer of hairs, more or less thick, is glued together with a solution made from the seaweed *Funori*, and left to dry. Then they are examined to see if arranged with the required regularity, the defective parts are removed with a knife, and the remainder arranged as an elongated cone. The workman then separates each part of the brush, and afterwards works it well against the edge and back of a knife. Lastly, he binds it with a strip of linen and fixes it in a small bamboo tube by means of the aforesaid *Funori* solution. He completes the process by a second combing and polishing between his fingers. The illustration shows the brushmaker established in his workshop.

The position for writing is similar to ours: the brush is held vertically between the first two fingers, resting on the thumb, which remains immovable. The right hand does not touch the paper, but rests upon the left wrist. The writer sits upon his heels before a low flat table; near him on the mat are pieces of Indian ink and vermilion, a brush, knife, a metal drain, etc. All these small objects are kept in a small lacquered box which forms his writing case.

Sometimes the hand-rest is made of a piece of ivory, bone, or bamboo, and also often takes the form of a broadened tile or piece of earthenware.

#### THE DRAWING.—ENGRAVING.

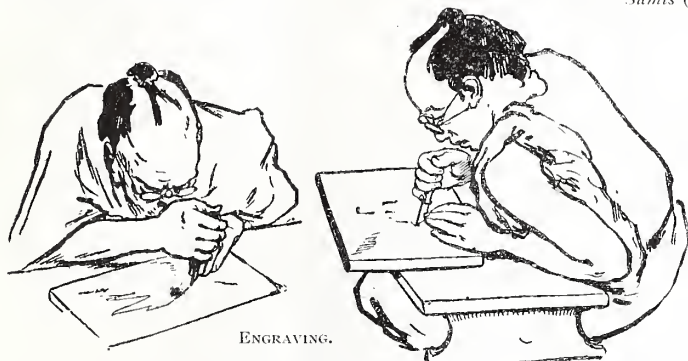
There is probably no other country in the world whose people—even the lower classes—are so familiar



them it is in general vogue with students, writers, artists, and artisans alike. They are accustomed to this position from their childhood, and so far from being disadvantageous is it, that in certain occupations, such as those of smiths, carpenters, and a score



of others, the workmen find it of much advantage, as the feet, having no special function such as sustaining the weight of the body, bring to the hands a very acceptable assistance.



ENGRAVING.

#### THE METHOD OF PRINTING.

The material necessary for the impression of the designs may be mentioned more briefly, and the following list may not be out of place :—

1. Two wooden tablets,  $24 \times 18$ -in., one horizontal supported by two pieces, the other inclined somewhat like a desk; the first of these tablets is for damping the sheets, which are printed on the second by the aid of special tampons for each colour.

2. Tampons, discs of thin card of five inches in diameter, covered by a sheet of woody bamboo stretched tightly and evenly across the face, twisting into two cords knotting together so as to form a handle at the back—all is done by hand, and the book printer uses all these tools while resting on his heels.

Besides these, there are two or three mortars of iron or porcelain (*suri-batchi*) with their pestles (*suriko-ki*) much like drinking cups, to hold the colours, with the brushes, which are of two kinds, the one flat for damping the paper before printing, the other harder and thicker (*haké*) which is used to spread the colour on the parts left in relief by the engraver. This operation is equivalent to the inking process in our printing; for this delicate work a piece of muslin is stretched tightly on a small wooden ring with a handle attached (*souti-no*); the colour is distributed more equally by this means than by the use of the brushes, which as they become more and more used are difficult to handle.

The construction of these brushes is also very curious. The handles are of wood of two kinds, the one of a piece of wood so split that the hair bound by bristles is in three rows and close as in the clapper. For the other, the thicker one, two separate pieces of wood equally bound by the bristles are provided.

We will give a list of the colours most used in this kind of impression :—

*Tamango* (light yellow).  
*Ai* (dark blue).  
*Yama Buki* (light orange).  
*Tatsutsi* (silver-white).  
*Taicha* (brown-red).  
*Sumis* (black).

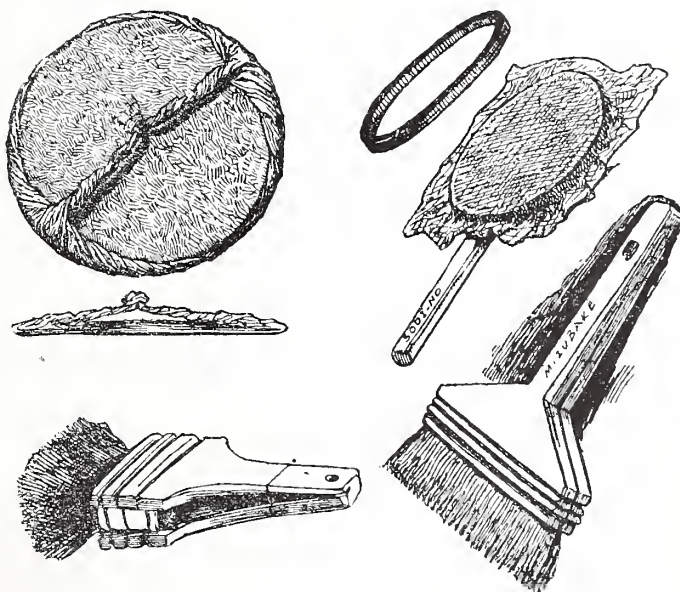
*Toka* (dark maroon).  
*Kusa* (lettuce-green).  
*Yubana* (mastic-white).  
*Chiai* (vermilion).  
*Murasaki* (bright violet).  
*Beni* (brown lake).

The composition of this last colour is not known, its inventor jealously guarding the secret of manufacture. The colours pounded in mortars are diluted with cold water, except the *murasaki*, which requires boiling water, and is mixed with a solution of *mioban* (alum) and of *nikana* (skin glue). The mixing of colours is done on a wooden palette.

Each sheet having been damped and placed on the relief engraving, is lightly rubbed with the tampons, avoiding anything approaching stamping. It requires an expert to place the sheets on the register marks obtained by means of notches made in the four corners of the wood, and as soon as printed they must be put in the press to prevent warping.

The bright colours are obtained by giving a slight coating of rice glue to the wood before spreading the colour, without this the tones are always somewhat dull.

The Japanese printer has other resources: he uses gold and silver powders and dry impression, thus giving gofferings which tastefully underline the outlines of the design. In short, although using very primitive methods, the Japanese obtain results which



are unsurpassed; the operations to be accomplished are so minute that they require much experience and care, so that we may fairly say that to pull an impression from the plate requires as much talent as that of engraving the block itself, and the work of

the printer compared with that of the artist is quite as valuable and necessary as that of an actor reciting his part well—he also is an artist.

#### THE MAKING OF BOOKS.

Each volume contains a large number of sheets folded in two, of which the sides are parallel to the fold and bound by a cord forming the back; exactly contrary to our method of stitching books.

The sheets are printed first on the right hand and then on the left hand, the two outside surfaces must be so arranged and imposed and got ready for binding, and the part which to the European idea is the beginning of the book must appear as the last page. Each page is enclosed in rules, and the centre of the page is the middle point between the rules on the *recto* and *verso* pages. The title-pages shew first the title of the work, second the number of the page, third the name of the writer. The finished volume is coloured and striped according to taste. The sheets are simply stitched together with the card cover, this method being impossible except with such supple and solid paper as this special paper manufactured in Japan.

At the Exposition Universelle of 1889, a full exhibition of Japanese papers was made by some of the chief makers, among them a large variety of hand-made papers from the Imperial Printing Office at Tokio, well illustrating the Japanese skill in this branch of industry.

Taking into consideration the use of machines for manufacture and printing, we may easily understand that it would be impossible here to strictly apply the methods and designs of the Japanese artistic printers, but nevertheless their ideas of work, and more especially of colour, may be studied with profit by craftsmen in Europe.

CONCERNING the discussion on painter artists as judges of photography, the *Amateur Photographer* discusses the statement made, "A painter may not necessarily be an artist." The profit and reputation he may derive from the exercise of his art must not be taken as a gauge of merit. His work may be decorative, it may be popular and even clever, and yet be far from attaining a high artistic grade, just as there are popular photographers whose work no one would dignify as revealing artistic aims. Thus the inference is deduced that it would be insufficient to include gentlemen who wield the brush on a committee of jurors, unless their general and artistic sympathies are broad and unprejudiced.

THE new grained paper, having a surface composed of little pyramids, of which we gave a notice in a previous issue, is known as "pyramidenkorn" paper. It was designed by Herr Gust. Shaenffelen, of Heilbronn, and is being introduced into this country by Mr. Alph. Steiger, of 16 Mincing-lane, London, E.C. Such a paper must of necessity do away with the mechanical concentric circlings characteristic of most previous grained papers, and in use will produce tinting more nearly allied to stone-grain work than anything yet introduced, whilst retaining all the other good qualities of a grained paper.

## Half-tone Etching on Copper for Typographic Blocks.



\* \* \*

COPPER, being tougher and harder than zinc, makes a particularly good metal for type press work. It will stand double the number of impressions, and show no wear whatever. Besides, the results are finer and better in every way. Inasmuch as nitric acid is not a useful mordant for copper, entirely different methods of procedure are necessary.

It has long been known that bitumen contains properties of being sensitive to light, and this article will form our sensitising mixture. The formula below for preparing the bitumen is to *increase* its sensitiveness, which in this age of haste and "do-things-quickly" is an essential.

Dissolve seven to ten grammes of sulphur in a sufficient quantity of carbon bisulphide, and then add 100 grammes bitumen. The solution is then freed from carbon, and placed in a drying stove, in which the temperature is gradually raised to 356° F., until the odour of sulphuretted hydrogen disappears, which requires about five hours. The bitumen, after this treatment, shows itself in the form of a black mass, brilliant, insoluble in alcohol, but equally soluble in benzine, turpentine, etc. Four parts of this bitumen is dissolved in 100 parts of benzole, which forms the sensitising mixture.

The copper plate, having been polished with charcoal (which is made for this purpose), is dried, then coated with the bitumen solution, using a whirler to distribute it evenly over the plate. It is now placed in contact with the negative, exposed in bright sunlight for ten minutes, developed in a bath of turpentine in the dark room. The turpentine dissolves all the coating that has been protected from the light, leaving the image clean and clear.

The plate may now be touched up, using a fine brush, and the sensitising mixture placed in the light for a time, when, after painting the back with shellac, it is ready for etching. One ounce of a saturated solution of perchloride of iron is added to four ounces of water, and the plate is placed in this solution, using a glass or porcelain tray. The biting commences immediately, and is to be continued until a sufficient depth is reached, which can be judged by scraping through the coating on the margin, and when the finger nail catches against the edge it is deep enough. It should be about the depth of the thickness of a tin plate.

This plate should be brushed during etching to aid the solution in getting at the metal, using a soft camel-hair brush. The plate is now ready for mounting, routing, or sawing away the edge, and nailing to a block of mahogany of a thickness to make the whole just type high.

Copper is being extensively used now, and half-tones on this metal command a higher price in the market than zinc work. This process is very simple, and gives excellent results.—*Photographic Times*.









## How to Colour Lantern Slides.

**N**OTHING is more interesting and satisfactory to the amateur photographer than to place upon the screen, by means of a good lantern, the results of the summer's work; and while it may be questioned whether anything can be more desirable for projection than a really first-class, well-toned lantern slide, yet experience proves that the majority of people who enjoy an evening with the lantern are pleased when a coloured slide is shewn.

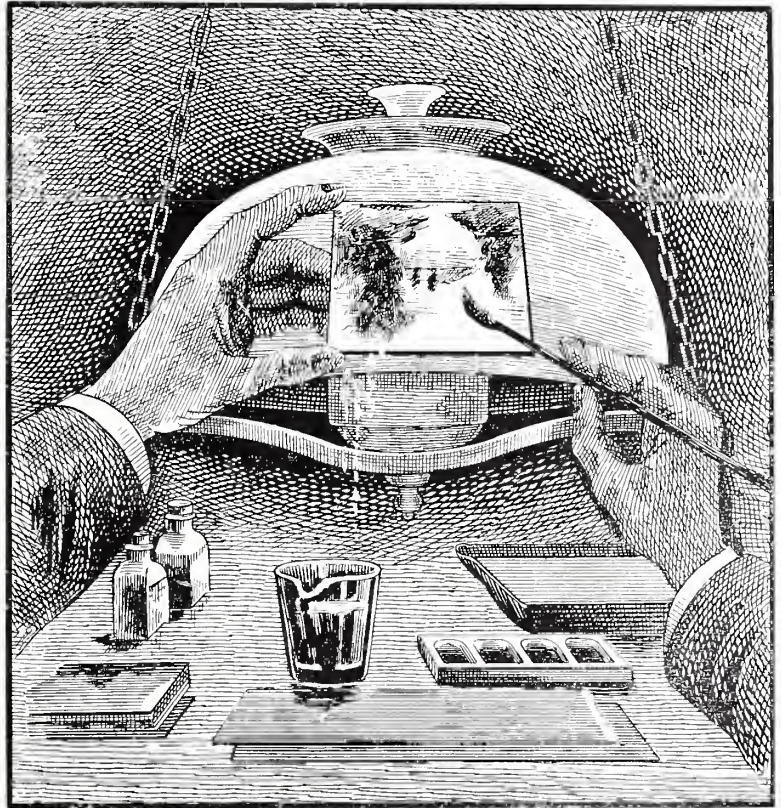
A suitable subject, carefully printed and artistically coloured, when reflected from the screen, strongly resembles a big water-colour picture, the only great difference between such a picture and a water-colour being a superabundance of detail, which is inherent in photographic pictures and which is not desirable in a water-colour. A photo can be made which will answer admirably for colouring, which would not be satisfactory as an uncoloured picture. Such pictures are taken through a large diaphragm or with full opening. The foreground is made sharp, while the middle distance and distance are softened down by being a little out of focus: however, it is not advisable to try to make negatives expressly for coloured pictures.

The print for colouring should be moderately light and without great contrasts. Inky shadows are to be avoided, and it is well to vignette off the distance to give atmosphere. The sky should be transparent, unless cloud effects are to be shewn. While specks, pin-holes, and lint are very damaging to an otherwise fine lantern slide: they entirely spoil a picture for colouring. In a picture well broken up, as in a woods scene, where little sky appears and when there is no placid water, these small defects do little harm; but in a sky, or in a clear lake or pond, they can never be concealed or removed so as to be unnoticed; so that the first requisite for a good coloured lantern slide is a good print of the proper intensity, and with transparent lights. The second requisite is a knowledge of colour and colouring, and the third and last thing needed is an assortment of colours and brushes.

With regard to the slide itself, it may be mentioned in passing that anything which tends to harden the film in developing, fixing, or after treatment, interferes

with the free working of the colours. For instance, alum in the fixing bath, intensifying and reducing solutions all tend to harden the film and prevent the free absorption of colour.

The first operation in lantern-slide colouring is to soak the plate in cold water until the film will absorb no more; then, while it is still wet, go over the entire surface of the film with a thin wash of warm colour, which may be either yellow or pink, depending upon the subject. This kills the chalky whiteness of the high lights, and gives the entire picture a warm tone, even though the wash is not sufficiently strong to be detected when the picture is thrown upon the screen.



The colours used for this purpose are transparent aniline colours prepared for colouring photographs. They are labelled brown, blue, violet, flesh, orange, green, and so on. The ordinary aniline dyes may be used instead of the prepared colours, as they are practically the same. The manipulation of the colours is the same as in water-colour painting. The film is kept wet continually from the beginning to the end of the operation; but after the broad washes of the first warm tint and the final sky colour, the water lying on the surface of the film is allowed to dry off, leaving the film still swollen and wet, but without the surface water.

The prepared colours can rarely be applied to the slide without being reduced with water. Sometimes the best effects are produced by mixing different colours before applying them, while in other cases the effects are secured by separate washes of different colours superposed. Each wash of colour sinks into the film, and is not removed by a subsequent wash.

Although an easel or support something like a retouching frame may be useful, the writer prefers to hold the slide in the hand, as shewn in the engraving. The wet plate is held in a slightly inclined position in front of a lamp provided with a plain opal or ground-glass shade. The writer prefers artificial light for colouring, as the pictures are to be shewn generally by artificial light, which is yellow. If the pictures are designed for projection by sunlight, it is undoubtedly better to colour them in daylight.

The first wash is preferably put on while the slide is held in an inverted position, and while it is still flowing the blue is added for the sky, at first very light near the horizon, increasing in intensity toward the top of the slide. After this wash is set and superfluous water has evaporated, the water accumulating along the lower edge of the plate is removed with the fingers, and the slide is turned right side up, when the extreme distance, whether it be mountain or foliage, is covered with a light wash of blue, and this wash is brought well down toward the foreground. If the blue appears cold, it can be toned down by a very light wash of yellow or red. Trees in the middle distance can now be gone over with a light wash of orange, or orange with a little of the flesh colour or pink added. When near the foreground a very light wash of green is applied to the foliage, but the raw green of the colour set cannot be used for this; it must be modified by the addition of orange or of brown. If when applied the green appears too cold, it may be toned down by a light wash of brown, of orange, or flesh colour. It is desirable to produce variety in the foliage.

Rocks in the distance are washed with blue, and the colour is subsequently modified by washes of red or brown. Trunks of distant trees and some rocks may be left nearly the original colour of the photo, but near rocks and tree trunks may be tinted with brown, blue, or warm green, and subsequently modified by washes of green, red, brown, yellow, or orange.

It is useless to trace the smaller branches of trees and shrubs, and it is rarely necessary to deal with single leaves or blossoms; when this must be done, a jeweller's eyeglass is required, and fine, small brushes are used, great care being taken to keep within the outline of the object being coloured. In all this work the artist does well to remember that the colouring is to stand the test of great magnification and strong light.

The plate is apt to dry out in some places while the colouring is going on at other places. As colouring cannot be successfully done on a dry surface, it is important to wet the surface before proceeding. This is done by applying water with a soft camel-hair brush. After the surface water has disappeared the colouring may proceed.

It is obviously impossible to mention every modification of colour that may be produced by mixtures and

washes. This is something to be acquired by practice. The writer uses very few colours, rarely more than the following—blue, green, brown, orange, flesh, rose, and yellow. The last is a strong colour, which must be applied with caution. Green and blue are also strong colours which can never be applied without the admixture of a warm colour or a subsequent wash of the same. Brown in different strengths has a large application. It is useful in toning down bright greens, for rocks, tree trunks, earth, etc. A wash of blue over the brown produces a different but useful grey.

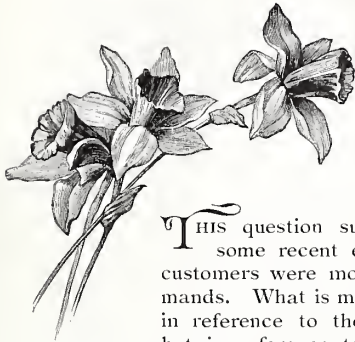
The principal points to be observed are to keep the plate always wet, to use light washes, to modify colour by subsequent washes, and in working up details to preserve the outlines.

Should a small area be over-coloured, the colour may generally be removed by means of a soft brush charged with clean water, the brush being gently and repeatedly passed over the spot. The brush is frequently washed during the operation. When the broad washes show streaks, or when the entire slide is too highly coloured, or the effects are unsatisfactory, the only remedy is to place the slide in cold water and allow it to soak, with occasional changes of water, until the colour is partly or entirely removed.

It is well enough to bear in mind that a coloured lantern slide bears all the colour that is to appear on the screen; consequently, it must be more highly coloured than a transparency for direct vision. On the screen, however, a picture is better under-coloured than over-coloured. It will often be found that prints which are too light and flat for use as plain slides answer very well when coloured, and pictures which are too dark for use as plain slides may be tinted with blue and presented as moonlight scenes. Brushes for this work should be of the best quality, very soft and pliable, and such as are used for working up detail must have a fine point. This method applies to portraits and figure pieces. The coloured slides are generally mounted in the same manner as the plain ones. If, however, the highest perfection is sought, thin plate glass is used for the sensitive plates, and glass of the same kind is used for covers, the cover and coloured picture being cemented together with Canada balsam. This makes the slides more transparent; but in view of the extra trouble and expense, the improvement over the uncemented slides is hardly sufficient to warrant the general application of this method.—GEO. M. HOPKINS, in *Scientific American*.

EVERY artist, whether he is an architect, decorator, painter, sculptor, engraver, or what not, must accustom himself, if he wishes to grow stronger in his art, to the real necessity of incessant copying of plants, animals, and the human figure, striving in each case to catch the exact expression of his subject, reserving to himself, of course, the right to modify the expression according to the mode of his composition. He should fill his sketch book also with sketches from artificial objects taken directly from the object itself in all cases, and even from the drawings of other artists, if need be; and he must not neglect the duty of those principles of geometry and mathematics which underlie so many decorative schemes.





\* \* \*

Can Gold Bronzing  
be  
Absolutely Permanent?



THIS question suggests itself owing to some recent experience in which the customers were most exacting in their demands. What is meant by permanent is not in reference to the lustre of the bronze, but in reference to its perfect adherence to the paper. Fortunately, customers are not so often met with who carry their views to such an extreme issue. But in this case it is contended that the bronze dust becomes detached from the paper and mingles with the article of manufacture, thus in their eyes decreasing its commercial value. This may or may not be the case, and it is very curious to note that, although bronzing has been carried on for so long, this serious drawback has only just been discovered.

We are not intending to shield bad workmanship by any means; quite the reverse. We have seen samples, we have tested them, and there is not the least doubt that such samples approach perfection in bronze printing as closely as anything published. Over and over again difficulties present themselves in bronze printing, and frequent occasion has been taken in this journal to deal with the matter. But, notwithstanding the excellence of the production under review, still the customer finds fault. We might almost answer the question whether bronze can be printed absolutely adherent by quoting the old parable of the camel and the eye of the needle. Perhaps it is too much to say it cannot be done, for there are so many trade secrets in our business that we cannot, with certainty, conclude that the key to the whole process is not in the possession of someone. If so, for the benefit of the trade, the fortunate possessor might help his fellow craftsmen to keep business in the country by divulging the means to this end. Before anyone contemplates such a course, let him know the nature of the test it will be submitted to. It is much the same as usual in the printing, only that it is executed on a good steel blue paper. After printing it is calendered and finally punched. In testing the work, either singly or in the sheet, it is next to impossible to move the bronze with the finger nail; to do that a knife must be used. But by rubbing the dry hand over the sheet with heavy pressure, sufficient particles of bronze may be picked up to give a film of bronze on the ends of the fingers. The quantity thus collected is very small, and we doubt whether in actually using the work such a forcible test is ever applied. Yet this is the reason for rejecting the work, and we must conclude that the customer is really in want of something to find fault with, for there is scarcely any bronzing which cannot be rubbed off more or less, even after weeks of lying on the paper.

PHOTOS THAT YIELD COLOURS.—At the last meeting of the Paris Academy of Sciences some coloured photographs of the spectrum on albumen and bichromated gelatine, by M. G. Lippman, were exhibited. It was stated that albumenised and gelatinised plates soaked in bichromate of potash may be employed for photographing in colours. They are used like silver salt plates, being placed so that the mercury is in contact with the film. The colours will appear immediately after immersion in water, which develops and also fixes the image. It disappears on drying, but reappears as soon as the plate is soaked. The colours are very brilliant and visible at all angles. Those of gelatine plates are brought out by simple breathing. The theory is analogous to that of silver plates, the maxima and minima of interference producing hygroscopic and non-hygroscopic layers with varying refractive indices.


THE National Society for Checking the Abuses of Public Advertising was formed at a meeting held on February 14th, Mr. W. B. Richmond, A.R.A., in the chair. A first list of members includes many names familiar in literary and art circles, and some legal and political leaders. The objects of the society are—(1) To check the abuse of the practice of spectacular advertising; and (2) to protect and promote the picturesque simplicity of rural and river scenes, and the dignity and propriety of our large towns. No doubt there will be a tendency in some quarters to sneer at the society as fastidious or interfering with trade, but anyone who has occasion to travel anywhere must admit that there is ample scope for its efforts in the direction of removing painful disfigurements.

*The Pharmaceutical Era* gives a liquid for bronzing paper, leather, glass, etc.:—Dissolve 10 parts diamond fuchsine and methyl-violet, by the aid of heat, in 95 per cent. alcohol. Then add 5 parts benzoic acid and boil five or ten minutes, till the green colour has changed to a lustrous bronze. It is easily laid on with a brush, dries rapidly, and is brilliant, durable, and adherent. An easily prepared article, for application to leather, metal, wood, or other surfaces, is made by dissolving 50 grains each of red and violet aniline in 2-oz. water, over a water bath, add 50 grains benzoic acid, and boil a few minutes, until the greenish colour has changed to a light brownish bronze.

LUMINOUS PHOTOS.—A photograph can be made luminous in the dark by taking a white mount, and after coating it with starch paste, sprinkle over it luminous powder and press it down firmly to make it adhere. All that is now necessary is to make the unmounted silver print as transparent as possible by coating it on the back with castor oil and wiping away the surplus oil. If this is placed over the prepared mounting card and exposed to daylight, a luminous positive is obtained.

THE sale of lithographic stones at Solenhofen is severely affected by the increasing use of zinc plates. The company working the quarries paid no dividend for 1891 and only two per cent. for 1892.

## Clippings from the Photographic Journals.

HOTOGRAPIHERS are accustomed to look upon photographic lantern slides as perfection, to decry coloured pictures, and assert that ere long they will be things of the past. No doubt, for an educated audience, good photographic lantern slides are appreciated in preference to the crude and in many cases badly executed coloured reproductions which are only now obtainable, for the beautiful art of slide painting which flourished twenty years ago is now practically dead; but the case is very different with an audience drawn from the rougher and lesser educated portions of society. During the Christmas holidays we gave a lantern evening to a number of lads engaged in the selling of newspapers in the streets of Coventry, and we noticed it as an undoubted fact that unless the photographic slides were exceptionally striking they did not come in for anything like so enthusiastic a reception as did the coloured pictures which we interspersed amongst them. One can only wish in this connection that the beautiful work of the past could now be obtained, but the competition of the chromo-lithographer and the photographer have made it impossible for the high-class slide painter to live. People will not nowadays pay 30/- or 40/- for a slide when they can get them at 1/- each.—*Photography*.

SPEAKING of the desirability of reproducing each of the priceless MSS. and similar treasures at the British Museum and other national repositories, which by a catastrophe by fire or otherwise might be so easily destroyed, Dr. Richard Garnett, who, as Keeper of Printed Books at the British Museum, has for many years advocated the reproduction by photography of those literary gems committed to his care, says, "All that is wanted is a public photographer. In so far as photography for public objects is concerned, the photographer as a tradesman must be suppressed. The State must enlist him, the State must pay him a fixed salary, requiring the whole of his time, and the State must provide the assistance which would be requisite, and the necessary apparatus and chemicals. The actual and ultimate cost to the nation would be very small; it would, in point of fact, be to a great extent defrayed by the public demand for photographs of objects in the British Museum itself, which is already very considerable, and would be immensely increased by the great reduction of cost consequent upon the photographer becoming a public officer."

DR. MUSCHOLD, of Berlin, has, it appears, succeeded in photographing the vocal organs *in situ*, by means of a flash actuated by electric current. Really, if the lens penetrates much farther, the source and degree of our individual and pet liver complaints will be subjected to photographic investigation, and those names which in foolish moments we have declared to be "imprinted on our hearts" will be reproduced by photography set in operation at the moment of an unguarded yawn!

A TRIBUTE TO PHOTOGRAVURE.—According to the *Daily News*, Mr. Holman Hunt is very much pleased with the photogravures of his Oxford picture, the Magdalen choristers and officials singing their hymn at sunrise on the roof of the college chapel. Looking at a copy, he said, "In some former engravings and woodcuts of my pictures I haven't been able to recognise my faces, and have had to ask myself, 'Is that really my expression on that face?' But in this photogravure I see with delight my own work everywhere: the boys and men I designed and know. The only points where the process has failed are in making a piece of surplice here and there too light, and in not making a shadow or two quite dark enough. These shortcomings I have corrected on one or two copies, and my assistant is colouring the other copies as near to mine as he can. I then give at least an hour's work to each copy, and do not allow one to go out to a subscriber till I am satisfied with it." We think the owners of these engravings will be glad to know that every copy has some of Mr. Hunt's own handiwork on it.

THE Berlin Photographic Company are about to publish a fine photogravure reproduction of Raphael's "Madonna di San Sisto" of the Dresden Gallery. The next in point of desirability to possessing original works of the great masters is to have such really magnificent copies in untouched photogravure, and the benefit which the present generation must derive from the frequent contact of these works can hardly be calculated. A contemporary, speaking of this particular publication, says:—"In a word, this is not an interpretation of Raphael's work: it *is* his work, somewhat reduced in size, and deprived of colour. If we were to write a volume about it as a reproduction, we could say no more than that; and it is beyond our province to write of Raphael's picture."

At a recent meeting of the Midland Camera Club, Birmingham, the president (Dr. Hall-Edwards) exhibited prints and slides toned by the "Photochrome" process (patent). The tones obtained were numerous, varying from a grey-blue to a bright blue, and from blue-green to a bright emerald green. A large number of bromide prints toned in a great variety of colours were shown; some of them exceedingly artistic. A very much larger range of tones was shown in the slides than in the prints. This, Dr. Hall-Edwards explained, was due to the fact that the experiments upon papers had only just been commenced, whereas nearly every make of lantern-plate had been dealt with.

GELATINE SLIDES FOR LANTERN PROJECTION.—Professor W. J. Waggener, in the *Scientific American*, states that he has been very successful in making diagrams and pictures for projection by the magic and the solar lantern by printing the same, with the ordinary printing press and engraved blocks, on sheets of transparent gelatine. By this means excellent lantern slides from diagrams and engravings of nearly, if not quite, all kinds can be made and multiplied as rapidly and almost as cheaply as paper prints.



PLATE IV.—ETCHING ON ZINC.

By MR. S. L. WENBAN, MUNICH.







## Etching, Drypoint, Mezzotint.

By HUGH PATON,

*Associate of the Royal Society of Painter-Etchers.*

### ETCHING.

#### SCRAPER AND BURNISHER.

**T**HE remedial measures which I have already explained are such as plate 2 required, and they include the chief measures generally found necessary for the completion of a plate, for you must make up your mind that no plate that is in the least degree complicated, hardly even the simplest, indeed, is completed without a resort to re-grounding, whether for re-biting or adding work, or both, and the use of the scraper and burnisher. The former I have fully described, but a few words on the use of the two tools may be useful.

The bayonet-shaped tool called the scraper, which should be kept bright and sharp, may be used in two or three different ways. It may be used very lightly to remove the slight burr of the drypoint lines so often utilised to finish the sky and distance, or, indeed, such as may have been used on any part of the plate, the proof of the drypoint line with the burr retained not being in harmony with that of the etched line. It is used again with more force to reduce parts that are too strongly bitten and require greater reduction than mere polishing would accomplish. The surface of the copper should be lowered as evenly as possible until the work is reduced nearly to the strength desired. If the tool be used carelessly, the surface of the metal will show numerous corrugated hollows that have an ugly look in the proof. And further, this tool may be used to remove altogether portions of the work that it may be necessary to do again. This applies specially to small portions of the plate. Larger erasures may be better treated in a manner to be explained presently.

The burnisher, a tapered piece of polished steel, which must also be kept bright, follows upon the use of the scraper, and is always needed when it is desired to polish any part of the surface on which the scraper has been used. It must be used vigorously with oil or water, and followed with a stick of charcoal, in order to get the surface back to its original condition. It may be used also to reduce the strength of bitten work where only a slight reduction is required. The scraper, which interferes more seriously with the surface of the copper, should only be resorted to when necessary, on account of the labour involved

in repolishing. Distance that is slightly overbitten can generally be reduced by the burnisher without resort to more violent measures. This tool should never be used to remove the burr of drypoint because it crushes the particles of copper into the lines and so destroys their purity. If the scraper be kept bright and keen, and used with a light hand, it will do the work properly without scratching the surface.

I find that in the last paragraph but one on page 94 [see No. 9] I did not make it quite clear why it is desirable that distance should be firmly bitten rather than underdone. As I pointed out, when distance is overbitten it can be reduced without much difficulty, whether by charcoal or by the burnisher may depend upon circumstances. But, on the other hand, if it be underbitten it is extremely difficult to re-ground the plate with the roller for re-biting with any certainty. You are very apt to fill, or so cover up, some of the lines that the acid does not attack them at all, or what is worse, only some of them. Hence the desirability of biting the distance firmly rather than otherwise. And conversely it is advisable to err, if anything, on the side of keeping the biting of the foreground rather within the mark, because the plate is easily re-grounded with the roller without any danger of the lines getting filled up, and re-biting is easy. But when the foreground is overdone the labour of reducing by the use of the scraper and burnisher is very considerable, and the result is not so satisfactory.

I may add here, on the authority of Mr. Frank Short, that some etchers make a practice of over-biting the distance with the intention of using the burnisher afterwards. A greater amount of modelling is sometimes obtained in this way, but it requires a considerable experience both in the use of the acid and that of the tool to be able to do this well. The student will be wise to rely upon the acid for as much of the work as possible, and only to resort to the burnisher when necessary.

#### ERASURE OF WORK.

When it is required to erase work from any considerable portion of the plate, it is better to do it in a different way. Proceed, first, to rub down with finest sandstone or pumice until the work is removed. Then polish by the use of snakestone, followed by charcoal and water, first a strong stick then a finer one. Use plenty of water and do not spare the elbow-grease. This is rather laborious work, and the plate, as a rule, is best sent to the polisher, but occasionally an hour so spent will save you vexation and delay. Keep, therefore, one or two pieces of the necessary materials beside you.

It will usually be found that the reduction in the thickness of the copper following upon the erasure of work is very slight, so slight that no difference is perceptible in the proof, the use of the blanket in the press serving to equalise the pressure. But, should the new work on such portion of the plate prove weak in the print, the defect may be remedied by pasting on the back of the plate a piece of paper of the thickness required. It should be cut to the shape of the portion erased, pasted on at the right

place, and the edges scraped down so as to taper off. The copper is so sensitive that the surface will show the shape of the piece of paper, after it has been passed through the press, if this be not attended to. This applies specially to the thinner kind of plates, such as the ordinary card plate.

When any narrow and deep reduction of surface has to be brought up to the level, such as might be occasioned by the removal of an isolated deeply-bitten line, or of a "blot," where perhaps a few short lines close together have run into one another in the biting, so as to show a black smudge in the print, the copper must be hammered up from the back. Mark the place carefully with a pair of callipers, and use a light hammer and a small steel punch. I keep two or three of these with points of various shapes beside me for the purpose. They are obtainable at any tool shop for a few pence. The face of the copper should be laid upon a polished steel anvil, or similar smooth surface. The face of an ordinary flat iron is as good as anything if you can remove the handle to your satisfaction. It is not so top-heavy as the anvil. Use the hammer carefully, as it is difficult to get the surface just right. Any over-raising of the surface can be put right by the use of a hammer with a round head lightly used. A hammer well suited for all these purposes can be got at any good tool shop. The head is of the ordinary shape, except that the small end is round and polished, like that of a button mushroom. When necessary, the surface can be finished off by polishing with charcoal, but the slight mark of the hammer will not show in the proof unless the tool has been carelessly used.

#### THE TELL-TALE.

The very greatest element of uncertainty in the biting of a plate lies in the effect of temperature on the rapidity of the acid's action. A mixture of, say, two parts of acid to three of water, which to-day works sweetly and steadily, may to-morrow act hardly at all, or may attack violently, according as the weather is cold or hot. Ten degrees higher or lower in the temperature will make quite a disproportionate difference in the rate of biting, and upset all your calculations. A simple way of reducing this uncertainty to a minimum is to hang in the bottle of acid a tell-tale in the form of a piece of copper wire. I use a strip cut from a plate, which, perhaps, is better, as it is of the same density as the plate upon which the acid is to be used. The copper wire might be softer and therefore not so sure a guide. The action of your mixture upon the strip will tell you in a few seconds whether it be in right working condition or not. It should attack steadily but without violence. Violence is to be avoided, as the line that is forced in the biting is raw in the proof. Add a little acid or water when necessary until the action on the strip is as you want it. Although it is desirable that the acid be mixed sometime before using, the addition of a little acid or water will not affect the action appreciably, but see that the bottle is well shaken before using its contents. The adoption of this plan will save much uncertainty, and enable you to bite a plate at different times with comparatively sure results.

#### VARIETY OF POINTS.

I find that in the earlier stages I omitted to say anything as to the number of points to be used. This is a matter as to which the practice of etchers differs. Some will use two or three points of different degrees of fineness; others use one only. It must be remembered that the acid widens the line at the same time that it deepens it, and therefore one point may suffice for all ordinary purposes. The whole of the work on plate 3 was executed with one point, and as far as I now remember so was all that on plate 2, the greater strength of that plate being entirely due to the longer time of biting and the greater strength of the acid used. It is only where extra vigour is required that a coarser needle than ordinary need be used. Let the point for ordinary use be fairly fine and leave the acid to do the rest, but carry with you a second needle with a coarser point for occasional use when the subject requires it. Some etchers may prefer to use two or three different points, and not to bite for quite so long a time. The result is, in the strong work of the foreground, a broader and at the same time shallower line. This line prints with a greyer quality than the line done with a fine point and bitten longer. The etcher will therefore do well to make one or two experiments in this direction, and adapt his method of using one or more points to the requirements of any particular plate. This, however, is a matter with regard to which the beginner should not trouble himself until he has had considerable experience. It would only lead to confusion and disappointment to attempt to master a detail of this sort in his early practice.

#### THE USE OF THE LINE.

Before passing from the subject of "Etching," it will be of service to call your attention to what I have already hinted at, namely, the practical bearing of the nature of the process on the use of the line in making your drawing. It must always be kept in mind that the action of the acid widens the line at the same time that it deepens it, as the biting proceeds. At first the acid can only work downwards, as the ground effectually protects the surface of the copper immediately on either side of the line which the needle has bared. But as it gets below the surface it begins to work laterally as well, and so undermines the ground to some extent. Therefore, the longer the biting the wider, as well as deeper, the line becomes. This must be kept steadily in view, especially with reference to shade or solid work in any part of the plate. It was for this reason that I instructed you, to refer again to plate 2 for illustration, to shade the sails of the larger vessel rather openly, and those of the further one more closely. If you examine the hull of the larger vessel, you will see that here and there the lines have run into one another. That is due to the fact that as they widened the surface between them was destroyed wherever they approached too near to one another, and though not lowered equally with the lines on either side, became a ragged edge that holds ink. The result in the proof is a solid blot. This blot is not always an objection, and may be used with great advantage where emphasis is required. But that depends entirely on what you are doing.



Here it is rather an advantage than otherwise, especially where the upper part shows solid black against the light of the distance, but in the sails such would have been disastrous and altogether destructive of the idea of texture. In other words, the accidental blot may be useful in rugged work of any sort, but must be carefully avoided in anything approaching tone. Therefore when representing, let us suppose, a strong shadow in three distinct values, draw it by regular lines pretty open in the foreground, moderately so in the middle distance, and close in the distance. Compare the sails of the larger vessel with those of the more distant one, and those again with the close shading of the distant pier, and this will be made clear. Therefore adopt it as an axiom that "the longer the biting the wider the line," and, *per contra*, the shorter the biting the closer the lines of your drawing.

Another thing that may be pointed out in this connection is that a tone may be obtained in two ways, either by shading very finely and giving a slight biting, or by shading less finely and biting rather more decidedly. As to which of these methods must be used in any particular case will depend upon the nature of the subject, and perhaps upon the idiosyncrasy of the artist, so may be left to his discretion. Compare, however, the two bits of distance in plate 2, and the receding buildings in plate 3 for variety of treatment in the rendering of tonic values.

#### REVERSAL OF THE DRAWING.

Judging from the number of questions put to me, there is a good deal of misapprehension existing in the minds of many on the subject of the reversal of the drawing. I have already pointed out that the subject in the plate is reversed in the proof, those objects which are to the right on the plate appearing to the left in the print, and *vice versa*. From the point of view of the amateur who does most of his work direct from nature, it is a matter of indifference which way the subject appears. The composition is surely of the same interest the one way as the other. Is it to be supposed for a single moment that the great master, Rembrandt, troubled his head in the least degree on a point of this sort when executing the landscape known as "The Bridge of Six" (indeed, according to the story, that might have depended upon how long it took to fetch the mustard!) or one of his numerous "beggars," or even the delightful head of his mother with which Mr. Hamerton has made us familiar in "Etching and Etchers"? The beginner is only creating an unnecessary difficulty for himself in imagining that he need take this into consideration at all. He may safely dismiss the question from his mind as far as ordinary landscape is concerned, and draw the subject on the plate without the least regard to the effect in the proof. If the work on the plate be right, the proof may be left to take care of itself. But there are one or two exceptions to this rule which it may be necessary to bear in mind when he has got through his earlier practice and comes to do more serious work. If he were etching any known subject, such as Windsor Castle from any particular spot, with a view to publication, it would be advisable to make a

preliminary outline drawing and trace it on to the plate *in reverse*, for the reason that, apart from the artistic merit of the proof, many more copies would in all probability be sold if the view in the proof were recognisable than would otherwise be the case. Then it becomes a commercial question, for a large section of the buying public is always influenced in favour of what it recognises; that portion of it which buys from the purely artistic point of view is comparatively small. And though some etchers affect to disregard anything and everything that suggests the merely commercial point of view, it is surely not *infra dig.* to bear in mind a point that may affect the commercial success of a plate, while it does not in any degree affect the artistic merit of the production! Apart, however, from this consideration, there is one point of view from which this question must not be overlooked, and that is the treatment of the human figure, especially where the hands are concerned. I have an old edition of Thackeray's "Pendennis" (Bradbury and Evans, London, 1850) in which the author's original plates have been used. In one of these, entitled "A Visitor at Shepherd's Inn" (page 94, vol. II.), Pendennis is shewn in the act of shaking hands with Fanny Bolton, *but both are using the left hand!* Whether the great novelist overlooked, or was simply indifferent to, the result—and the latter is quite as likely—does not much matter, but it certainly has an odd look in the illustration. Whether made from models or not, the drawing was done direct upon the plate with this result. Therefore the etcher must be on his guard when dealing with the human figure, especially where the hands come into play. Another curious instance of oversight occurred quite lately in a quarter in which it was least to be expected. In Mr. Hamerton's interesting volume on "Drawing and Engraving," published a few months ago, the author makes use of a plate to illustrate engraving with the burin, which shows a small head in three stages of progress. They are arranged on the page in pyramid form, but instead of reading, as one would expect, in the order  $2^1_3$ , the two lower ones are in the reverse order, thus  $3^1_2$ ! We are so accustomed to read from left to right that this looks extremely odd. It is no doubt due to oversight on the part of the engraver, who has executed the three heads in the natural order on the plate, with this result in the proof.

Again, in plate 1 accompanying these papers, which was specially executed for me by my friend, Mr. Chorlton, and in which the writer played the entirely secondary rôle of model, the needle had to be held in the left hand when the artist was engaged on that part of the plate, with the result that it appears right in the illustration. I almost regret now that it was not allowed to come out wrong, if only for the sake of illustrating this point. Of course, in a larger sense it is really a matter of indifference whether a figure uses the right hand or the left; the artistic merit of the proof is not influenced in any way; but it is nevertheless desirable to avoid anything *bizarre* in artistic work. The mind of the spectator should be quite undisturbed by anything but the artistic expression of the work before him.

Now, my reader, I hope you have enough information and instruction to enable you to set to work and make some satisfactory progress. At a later stage I shall furnish you with additional information upon many points that may, in the interval, have cropped up in your early practice, but a little experience will be required first in order that such may be of practical service to you. Do not be timid, but spoil a few coppers cheerfully, for in so doing you will learn much. If you have followed me carefully you should have no great difficulty in the technical part of your work. The artist in you must supply the rest.

I am glad of the opportunity to insert a small plate by the permission of the artist, Mr. S. L. Wenban, of Munich. It was executed on zinc. I may refer to it again when speaking of the respective metals and the nature of the lines printed by them.



### Psychic Photography.



WHEN Mr. Traill Taylor (editor of the *British Journal of Photography*) read his paper on "Psychic Photography" at the London and Provincial Photographic Association, on March 16th, he did not altogether exclude the comic side. He quoted the following anecdote he had written in 1873, at the time when fluorescence was explained by Dr. Gladstone at the Bradford meeting of the British Association.

A mischievous young lady of scientific proclivities who attended the meeting of the British Association, and who was addicted to practical joking, listened attentively to Dr. Gladstone's observations upon the properties of quinine referred to, and having carefully noted the discussion that followed, reasoned within herself thus: If solution of quinine can make invisible marks upon paper which will come out black in a photograph, it ought to do the same when applied to the skin. So she procured some of this solution, and upon her fair brow she painted with it a death's head and cross bones. These, of course, were invisible to human vision. Thus prepared, she went to a photographer to have her portrait taken. All went right until the operator went in to develop the plate, when she soon heard an altercation between the photographer and the attendant boy, in which it was evident that the latter was being charged with having coated an old or dirty plate.

A second negative was taken, with this result: that the operator, after bestowing a puzzled, affrighted look at the lady, rushed downstairs to the principal of the establishment. Both returned to the dark room, and a third negative was taken, when it became evident that intense excitement was being produced in the dark room. After an excuse to the lady about there being electricity in the atmosphere which had affected the chemicals, she was requested to sit once more.

Scarcely had the plate been developed when both photographer and assistant rushed out from the dark room, pale and excited, and explained that on the

brow of the sitter in each negative was emblazoned the insignia of the King of Terrors. The negatives were produced, leaving no doubt of the fact. What was to be done?

The sitter hinted something about not being disposed to be made a fool of by one who she was satisfied was a spirit photographer, and that she, for one, would not allow herself to become the victim of such absurdity. This upset the equanimity of the photographer, who expressed his earnest conviction that she was an emissary and personal friend of the common enemy of mankind.

"I shall look in again to-morrow," said the lady, in her sweetest tones, "If you promise not to play any of your silly ghost tricks upon me."

"Not for ten thousand worlds," said the artist, "shall you ever set foot within my studio again."

"Oh," she laughingly rejoined, "I shall drop in through the roof and visit you some day when you are disengaged;" and with that she departed.

"I knew it!" gasped the photographer. "I felt a sulphurous odour the moment I came near her. Send immediately for my friend, the Rev. —, and get him to offer prayer, and free the studio from the evil influences remaining after a visitation from one whose feet, although clad in boots, would, if examined, be found to be cloven."—*The Camera*.

—♦—  
A NEW SAFETY PAPER.—The large and continually increasing demand for paper which cannot be duplicated by unauthorised parties for use in printing certificates of stock, bonds, drafts, or notes, has led to the production of peculiar designs. A process, lately patented, for making paper of this description, consists in applying ink to a lithographic stone or other material, placing another plate, which may also be a lithographic plate, face to face with the first named, rubbing the faces of the two together for a time, and then taking them apart. The ink will be so distributed by the rubbing action that a variegated design will be produced upon the plate. If this design is not pleasing, the plates can be again placed together, and the rubbing continued until a satisfactory design is produced. The ink is then allowed to dry, and the lithographic plate is subjected to the usual treatment for lithographic purposes, and the design is transferred to the paper in the usual manner of printing from lithographic plates. This process is said to produce designs of such infinite variety of configuration and shade, that reproduction, except from the original plate, is practically impossible. The impression may be made in any desired colour.—*Paper World*.

—♦—  
THE American Treasury has decided to permit exhibitors at the Chicago World's Fair to make a gratuitous distribution of samples, catalogues, descriptions, etc., as far as these relate to exhibits, such articles to be admitted into the United States free of duty. But matter simply intended to advertise the business of a foreign firm must be entered as for consumption, and duty must be paid by the importers before delivery.



SPECIMEN OF  
*"Grained Paper" Chalk Work.*  
17500 PRINTED,  
DE MONTFORT PRESS LITHO.


PRINTED WITH FRANK HORSELL & CO<sup>S</sup> (LTD.)  
LITHOGRAPHIC INKS.  
HEAD OFFICE & WORKS, 47 MEADOW ROAD, LEEDS.  
*PRINTED ON GROSVENOR, CHATER & CO<sup>S</sup>*  
*"ACME" PRINTING PAPER.*





[By an oversight, the following notice was omitted from our last issue.]

## Lithographic Artists' Dinner at Hanley.

N January 20th, the artists of the pottery town mustered in full force to hold their annual dinner at the Victoria Hotel. It was marked all through with the earnestness and thoroughness which characterise these festive occasions, and illumine the atmosphere of the somewhat murky potteries. The dinner was well worthy of the caterers, who are accustomed to provide for other and more imposing ceremonies in the district, the branch of the Amalgamated Artists' and Engravers' Society making a happy choice when they engaged the Victoria Hotel for their purpose. The menu was all that could be desired, and many were the partakers of it. As a rule, the dinner is but the opening of the evening, and as soon as it was cleared away, the members and friends contributed most heartily to render the night a memorable and enjoyable one.

The musical programme was broken at intervals by the proposing and responding to toasts, which was, in a sense, the feature of the evening. Commencing punctually at 9 p.m., Mr. Wright (the branch president) proposed the toast of "The Queen," which was responded to by all. About an hour after that, Mr. Price (the secretary) moved the toast of "The Society," and in so doing, referred to the excellent position, both numerically and financially, of the branch. Mr. C. Harrap (general secretary) responded, and in opening his remarks touched briefly upon the length of time the Society had been in existence, together with the value of the work done. He reiterated the necessity of closer alliance with all other artisans in our own trade, as it would secure a better feeling and greater compactness in action. Taking up the general cry of foreign competition, he quoted figures and facts concerning German methods of production, which shewed plainly that the German printer could scarcely compete in speed of production, whatever he may do in quality. But he again pointed out that the German competition was confined to fine chromo work, and not to commercial work. On the same point he reviewed the speed of production and the conditions of labour in America, coupled with the much higher rate of wages paid in that continent, and he shewed that in commercial lithography the American cannot compete. It is only when he sends over a lot of surplus work, that he can find a market for his otherwise excellent chromos. In speaking of American power of production he remarked that some recent machines made there were guaranteed to run at 1,500 per hour. He deprecated the increasing flow of apprentices into the trade, already too full of willing workers unable to find employment, and in conclusion, said that to effect a change in this direction it is the duty of members to explain to those outside the trade the real position of the workers, and thus prevent them putting boys into it without first knowing the future to which they are probably destined.

Later in the evening, Mr. Wood moved a toast to the "Absent Members." Mr. Green responded in a few well-chosen remarks. Following immediately, Mr. Leary toasted the "Kindred Societies," and he expressed a hearty desire that there should be not only in the shop, but outside it, a greater and better fellowship between those whose interests were in every way parallel, and were best served by working in the greatest harmony. Mr. Clarke (secretary of the Hanley Typographical Society) responded in a most courteous spirit, wishing that the whole of the letterpress printers in Hanley could see their way to become true unionists. He spoke in the warmest terms of the federation of the kindred trades. Mr. Mawson (vice-president of the Hanley branch of Lithographic Printers) also responded in such a way as to make all present feel that the ball had been set rolling for the existence of closer coalition between the printing trades.

Mr. Hammersley presided at the piano, and not only accompanied the singers, but assisted in the harmony by some good comic songs. He was ably assisted in that direction by Messrs. Hall, Hunt, and Möhr. The other side of vocal talent was ably represented by Messrs. Langton, Cooper, Curzon, Price, and Redding. Mr. Cartledge gave a humorous recitation, and Mr. Redding executed a violin solo from "Les Cloches de Corneville." Altogether it was a most enjoyable evening, and when midnight arrived it was with considerable regret that the party finally dispersed.

The programme and tickets, characteristic of the high-class finish of the work in the pottery district, were designed in unique style by Mr. D. Price.



PRINTERS complain that they cannot get good prices for their work, and try to justify themselves for taking work at lower prices than they otherwise would by saying that other printers do the work at those low rates, and they are compelled to do the same. This excuse is weak. Journeymen printers sometimes set examples which employers might follow with advantage. A man will apply for a situation, and in reply to the question as to what wages he wants will name his price, and if the employer offers him less will decline it, although he knows that he may be out of work for several days as the consequence. The employer, on the other hand, will often take a job for much less than the price he first quoted, because the customer says he can get it done for that price somewhere else. There are exceptions to this rule, and the exceptions are those who get the best work and make most money. The small printers are the ones who are most often accused of cutting prices, but the fact is that there is a great deal of cutting done by firms which are large enough and old enough to know better.

THE QUESTION PAPER set at the recent Examinations in Lithography will be worked out in our next number.



## Photo-lichtdruck + in Natural Colours.

By DR. H. W. VOGEL, . . .  
in *Lithographic Art Journal*.

**P**HOTOGRAPHY in natural colours (as invented by Professor Dr. H. W. Vogel) was first suggested in 1865, when Cros and Ducos du Hauron photographed natural colours by using negatives with the sensitised films stained. They used three negatives for each picture taken, one on a red, the second on a yellow, and the third on a blue stained film. The three negatives so obtained were copied on collotype plates, and, from these, pictures were struck off by the use of printing inks, representing the complementary colour to the colour of the glass through which the negative had been taken. To print from the green glass collotype plates, red printing ink had to be used; to print from blue glass collotype plates, yellow dye was necessary; in short, to print from any of these collotype plates a dye was to be used of a colour which had not acted on the corresponding negative plate, in strict analogy with common photography, by which a picture is printed in black from a negative on which black has not acted. This principle could not be successfully employed until 1873, when it was my good fortune to invent ortho-chromatic plates; that is, plates sensitive for red and yellow, the plates (by using a coating of bromide of silver) having been already made sensitive for blue. Ducos du Hauron, in Paris, and Albert, in Munich, first experimented with these plates.

But the coloured pictures they reproduced seemed unnatural because they didn't understand the real complementary dyes. They took what seemed to be the best.

As I began to think over the matter I recognised soon that only by the spectroscope would it be possible to find out the real complementary colour, and I published as early as 1885 the principle, *i.e.*, the printing dye, the same as the dye used by me for making the plates red or orange sensitive, yellow or yellowish-green sensitive, etc.

It must be kept in mind that all the colour sensitive plates I made I prepared by the addition of certain dyes to the bromide of silver plates. For example, the blue cyanide makes the plate sensitive for orange or orange-red, and therefore the collotype plate prepared after such plate must be printed by cyanide or some other dye spectroscopically similar to cyanide.

In the same way the plate sensitised by eosine for yellow-green delivers the red collotype plates, which must be printed by eosine, etc. The plate sensitive for blue is printed by a yellow dye mentioned and published by me already in 1885 in my book. Mr. Ulrich, a chromo-lithographer, had proven first that this principle is right.

My son has improved the process by selecting the right dyes for colouring the plates, the right colour-screens, and the right printing dyes exactly corresponding with the matter for dyeing the plates to make them sensitive to the selected coloured rays.

Experiments with oil and other paintings of the best masters—as Menzel, Knaus, Graeb, etc.—have proven that it is possible to reproduce the real coloured pictures in the right colours.

We can in eight days do the work which, as done after the ordinary old chromo process by twenty colour stones, now takes about two months! And we are requested permission to make the first use of the process by the great art establishments of Germany.

We employed it at first for art and art-industrial reproductions instead of ordinary chromo-lithography. But we are beginning to reproduce landscapes and portraits in the summer season when the light is improving.

The reason is that we want three plates instead of one for each person, and these can only be had a short time in the summer. Every person must "sit" three times without moving. That is difficult.

Several other investigators may have tried to get similar results after the old process of Ducos du Hauron. But I have seen nothing similar to ours in truth, because all have ignored the spectroscopical principle above mentioned.

At the meeting of the Institution of Naval Architects, Lord Brassey was elected president, Lord Ravensworth retiring. In the course of his address the Earl of Ravensworth referred to a speech made by Mr. Caird, who is reported to have said that the more a man knows of his work, the better it is done; that was a strong argument in favour of higher education of workmen. And Lord Ravensworth would add that the better the work, the cheaper it was. Mr. Caird had quoted some figures illustrating the waste of materials and of money due to inaccurate workmanship. His lordship was afraid to quote the figures, they were so remarkable, for fear that his hearers should be incredulous. He might say, however, that the loss of coal in this way amounted to hundreds of thousands of pounds, whilst the total loss due to bad workmanship was to be reckoned, if it could be reckoned at all, by many millions. If a very small part of this money were expended on technical education, so as to secure the better work promised by Mr. Caird, if the greater knowledge could be attained, who would question the great economy and advancement of the nation? Lord Brassey is reported to have said he was fond of talking with working men, and he often got valuable information from their views, which were frequently very sound and shewed much shrewd sense!

THIS year the National Society of Fine Arts in France will open for the first time a section devoted to architecture. This departure offers an excellent and unique opportunity for architects who desire to see their art receive a recognised position. Alongside their designs they will be able to exhibit natural objects, models, etc., which they may have utilised in connection with their productions. In view of the first exhibition, architects are being called together, and those interested will have every facility for assisting to make the section a success.



## Bronzing Machines.

HOWEVER near perfection we may consider we have arrived in making bronzing machines, yet there are still some who have ideas on the matter, and continue to put them into practical operation. Although the "Silverlock" bronzer leaves very little to be desired, yet opinions differ on the question of polishing after bronzing, the supply of bronze, etc., and it must have been mainly from such considerations that a new bronzer has been brought out in America.

This machine is certainly intricate, and naturally more liable to get out of order were it not that the gearing is mostly by chains. The mechanism has been carefully thought out, although it seems to contain the feature of "loss of time," because each separate sheet must be delivered from the machine before a second can be fed in. A brief description of the machine will convey the whole construction and show more clearly where its qualities lie.

The sheet of paper is taken by a travelling gripper from the feed board between a number of rollers, which put on the bronze, then distribute it, polish it, and finally dust it off. These rollers are rigid in their upper bearings, but movable in the lower bearings, thus allowing the gripper to press them down and pass between. Undoubtedly this will become a source of weakness. However, these lower rollers are carriers, and serve only to support the sheet against the more active rollers above. Having fed the sheet into the gripper, a well-constructed roller, which receives its motion from a worm actuating a ratchet wheel, and is only rotated during the forward motion of the sheet, dusts the bronze on. This roller is at the lower part of a bronze receptacle, and is therefore thickly embedded in bronze. There should be a sufficiency of dust, the surplus from which falls under the machine into a receptacle which is part of the entire covering of the bronzing mechanism, so that from all parts

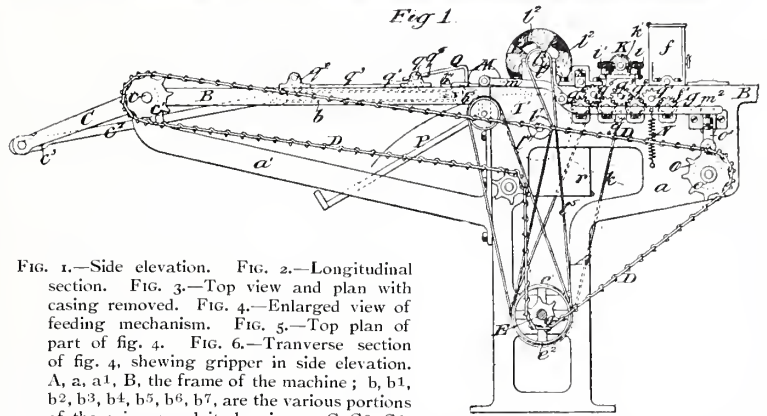
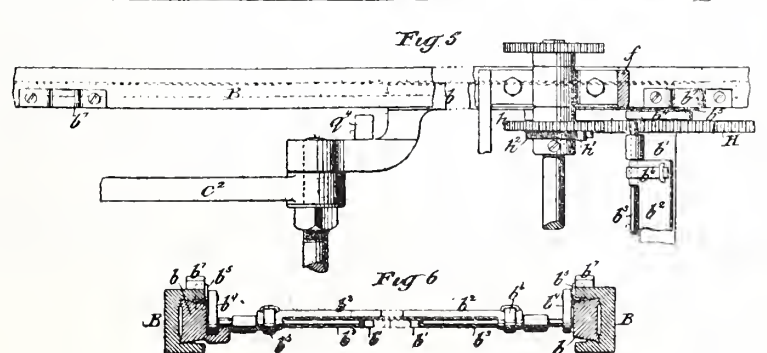
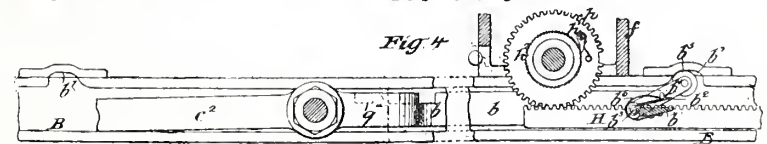
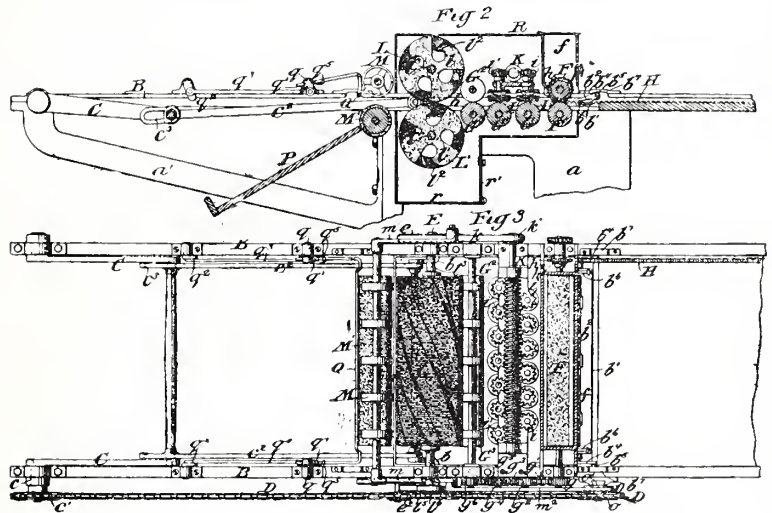


FIG. 1.—Side elevation. FIG. 2.—Longitudinal section. FIG. 3.—Top view and plan with casing removed. FIG. 4.—Enlarged view of feeding mechanism. FIG. 5.—Top plan of part of fig. 4. FIG. 6.—Transverse section of fig. 4, shewing gripper in side elevation. A, a, a', B, the frame of the machine; b, b1, b2, b3, b4, b5, b6, b7, are the various portions of the gripper and its bearings. C, C2, C3, are the mechanism to give the motion to the gripper; D is chain gearing; E is the driving shaft; e1, e2, pinions; F, F1, the bronzing rollers; f, the bronze supply box; G, G1, G3, carrying and supporting rollers; G2, feed roller; H, rack for driving bronzing roller; N, N1, N2, the cog-wheel, pawl and ratchet arrangement for intermittent action; K, the worm to drive the rotary polishers i, i1; L, L1, cleaning or dusting rollers, shewing (fig. 2) the section of the roller with arms l, l1, and rounded face l2, with shafts l3 l4; M, M1, discharging wheels; N, tension spring; O, chain wheel; O1, lifting slide actuating M, M2; P, delivery board; Q, the disengaging arm to throw the sheet out of the gripper; q, q1, q2, q3, q4, q5, the mechanism of Q.



of the machine the bronze falls to the same point. The sheet, with its full supply of bronze, is carried all the time horizontally under two rows of rotary polishers. These are placed across the machine, and so arranged in opposition to one another that every part of the sheet is polished. They are driven by cogwheels on their axes, which are driven by a worm running across the machine between the two rows of rotary polishers. Finally the bronzed and polished sheet passes between two curiously constructed dusting rollers; one to dust the front, the other the back of the sheet. These dusting rollers are built up by placing on a shaft a number of discs side by side across the machine. The form of the disc, in side section, is a rounded Maltese cross. The sharp points of such a cross are converted into round surfaces, that which meets the sheet first being more rounded than the other. The arms of the cross are made up of muslin, or some such material which will bite keenly without scratching. The discs are so arranged side by side that the ends of the arms form a spiral line across the machine. The sheet, in its finished state, is then carried between two discharging rollers, where the gripper loses its hold, and a bent arm is brought down to push the sheet out of the gripper and allow it to fall into the delivery box.

### Graver versus Process.

It is always well to look an adversary squarely in the face. This is the attitude that was only slightly taken recently at the first annual dinner of the International Society of Wood Engravers, by Mr. W. L. Thomas, R.I., who presided. While it is quite true, as he observed, that the much-threatened art of wood engraving has never been more worthily upheld than by the engravers of the present day, and that a fine engraving of this class has an inexpressible charm about it, still we know that process work has made fearful havoc among the ranks of wood engravers. But since the times of Palmer, who was the first to strike a blow at wood engraving, process work has undergone a revolution, which dates from the time that photography has been impressed into the service, for not till this was done was there any real danger to the profession. Over a quarter of a century has elapsed since, *à propos* of the Graphotype process, which was then being introduced, we published an article entitled "A Blow at Wood Engraving," which led to some far-seeing engravers taking just alarm at the prospects of their profession, and providing against a possible further development of that encroachment. It is really the Gillotype, or its congeners, for line work, and the grated screen system for half-tone that have imparted the most severe blow yet given to the wood engraver, and these processes have come to stay, and will eventually oust skilled handwork from its strongholds, at any rate from the important position it has so long occupied in relation to serial and book illustration. The time has now passed when wood engravers can afford to treat photo-process work as "a foeman unworthy of their steel."—*British Journal of Photography*.



### Copying Engravings and Drawings.

BEFORE the West London Photographic Society, on March 28th, Mr. H. Peal, president of the Ealing Photographic Society, gave a lecture on "Copying Engravings and Drawings." As requisites, he recommended daylight, preferably a top light, including a wide angle of sky, and appliances specially arranged for the purpose. The lecturer described the apparatus employed by himself in copying engravings in books, consisting of a base-board of box-girder form with sliding carrier for the camera, and an adjustable frame to hold the book or engraving. He advocated the careful ruling of sets of lines in rectangles upon the ground-glass screen of the camera to ensure facility in focussing. The camera front was raised and lowered by the turning of a disc mounted eccentrically. Coming to the method of working, the lecturer stated that the engraving must be centred with the lens, then focussed, and the final adjustment given. He used small stops, ranging from F-11 to F-22, to obtain due sharpness.

Mentioning the exclusive employment by professional photographers of wet collodion for copying, he claimed equally good results with less trouble from dry plates, such as the Mawson photo-mechanical plate.

He found no advantage in backing the plates, but he impressed his hearers with the necessity of carefully dusting them, and of excluding dust from the dark slides. For regulating exposure he used the Watkins meter. For reference he marked all negatives with a series number, a subject number (in relation to the Watkins meter), and an initial to indicate the developer used. After mentioning that he employed his negatives for the double purpose of producing prints and making lantern slides, the lecturer described a convenient apparatus for the latter purpose, in which the top light was reflected through the negative by a ground opal glass plate. An ingenious arrangement of cams was employed for centring and holding the plate in the camera.

For development the new developer, amidol, had many advantages, notably its quickness of action, cleanliness, and power of developing several plates in rotation, whilst it enabled the photographer to do with one-third\* of the usual exposure, and the developing dish required no rocking. The formula was:—

Amidol . . . . .	4 grains.
Sulphite of soda . . . . .	45 "
Bromide of potassium . . . . .	$\frac{1}{2}$ grain.
Water . . . . .	1 ounce.

The lecturer developed two plates with this solution, under somewhat adverse conditions, with complete success.

\* One-third of the time seems a little misleading, for the same thing should apply to all studio work when developed with amidol. This, however, is not an accepted fact.—ED.]



PRINCESS MAY ——— DUKE OF YORK.  
H. R. H. THE PRINCE OF WALES.



# T. J. Spence & Co.

DE MONTFORT PRESS LITHO

PHOTO-LITHOGRAPHED BY  
F. W. SEDGWICK, BRIDGE HOUSE, QUEEN VICTORIA STREET E. C.







## Transferring and Printing Copper and Steel Plate Engravings.

**I**T is a matter for regret that the art of transferring and printing copper and steel engravings should be passing more and more into the hands of the few. Lithographers should at least have some acquaintance with this old branch of their profession.

M. Valette, in his excellent manual, gives some useful points in considering this subject, and, as a practical worker in this direction, his remarks are worthy of attention. He says that for some time past it has been the custom to combine ordinary commercial and industrial lithographic work with engraving on copper, steel, and stone. The copperplate, as known thirty years ago, had its own special place in the printers' office, but, comparatively speaking, it is now a thing of the past. It is seldom used to print from except for some speciality, such as visiting cards, invitation cards, and similar small work requiring extra delicacy of treatment. From time to time the larger publishers produce some work of first-class quality, but as a rule, when making a comparison between former productions and those of to-day, one is compelled to admit that copperplate engraving has deteriorated in no small degree. Possibly this is attributable to the new processes of reproduction by photography, and the perfection to which the process of chromo-lithography has been brought.

For artistic work in intricate and filigree designs or letters, the employment of copper or steel is preferable, as these surfaces do not present the same difficulties as occur in the execution of such work on stone. Tints and fine work, almost impossible to produce on stone, are thus obtainable, the stone usually having a tendency to chip when the artist applies the diamond or graver.

Various methods are employed by the lithographer for the pulling of proofs from copper or steel plates. Many use a special transferring ink, rub their plates well, and heat them so as to make them warm and dry. From among these methods the following hints will be found useful for producing good work.

Some of the very best work may be obtained without the use of any special transfer ink, and it has frequently occurred that prints obtained by special inks have been much less satisfactory than work obtained from the best known class of writing ink, to which was added some ten per cent. of ordinary transfer ink. Lithographers who have had occasion to use this ink for transfers from the plate will be able to appreciate the ease and certainty of transferring.

This is easily explained: whether it be copper or steel, if care is not taken to clean off with the best substance for that purpose the print will be filmed over, and the plate will have a tendency to grease the paper. It is useless to ink up very full in further attempting to get better impressions, this inking being always more or less liable to ruin the work than ordinary inking. The employment of the ink in the stick appears defective and necessitates warm rubbing, besides taking longer than the other process. When this warm cleaning is used it is soon observed that the ink in use becomes cracked, thus tending to produce a certain coating of the lines, which, from the point of view of purity of design or letter, is undesirable, and unless it is well cleaned with terebene before inking and left to cool again, it is very doubtful whether the result will be at all successful.

The following method of procedure has always been productive of the best results whenever tried:—Use a good tampon made of old cloth, firmly rolled round and well bound. Take about ten inches of old machine blanket which has previously been well beaten so as to make it fit into all the crevices of the tampon, with its inner side outward; draw the four corners up together, fix them and tighten so that all feels as firm as possible. Put a few drops of turps on the inking table, work the tampon on it with heavy pressure, and when well saturated, singe it to remove any downy substance on the surface; clean well and work well on the stone with a little transfer ink and a few drops of terebene; then work it over and over again on some part of the inking table which has remained clean, until it becomes quite grey, and afterwards work it vigorously over the cold plate. This requires a suppleness of the wrist which is only obtained with long practice.

When, in the judgment of the operator, the ink has been sufficiently applied, clean the plate with a very soft pad, slightly covered with litho ink, and complete the cleaning with another soft pad, which must be extremely smooth on the surface and contain no loose fluffy particles. To avoid the film which sometimes appears on the surfaces of plates, more especially on new ones, rub the palm of the hand with Troye's chalk, and afterwards clean the plate with the hand thus prepared, passing it two or three times over the surface as may be found necessary. Use a rack which grips firmly and is somewhat smaller than the plate in use, and bed it on a stone sufficiently thick to withstand any shock. Choose India paper of the best quality and perfectly free from holes, grain, straw, or other defects, regularly sized and not too strong; damp it only as much as for stone work. Cut off a piece of unsized paper somewhat less in dimensions than the plate, and place it at the back of the sheet. Pull a proof with heavy pressure and use with each proof the unsized paper at the back. While this is being done, care should be taken to pull the impression in the main direction of the engraved lines, and when wiping out, wipe in the opposite direction. Then proceed for printing and mounting as for ordinary prints. In the case of a deeply etched engraving, ink the plate well, not by tamponing, but by rubbing lightly; leave to dry two or three minutes and clear

off as before. To keep the tampon in good working order, when the prints are pulled, it should be carefully rubbed over and put away in an air-tight box.

The inking of transfers of engravings on copper or steel should be proceeded with as for ordinary transfers on stone; but this class of work being very delicate, the workman should understand that he cannot afford to neglect any precaution if good work is to be produced.

It often occurs that prints are pulled from old plates, and, to make the best of them, every precaution must be taken in the inking and final pulling off. Use little ink on the tampon and proceed with gentle dabs, being careful not to twist the pad on touching the plate. Afterwards use a piece of linen already well inked, and in lieu of rubbing before commencing to pull off, tampon it gently with the linen, which takes off the greater part of the ink without injury to the lines. Then, with a piece of rag, wipe the parts around the engraving, pass the dry palm of the hand well over it, and pull a proof on India paper, taking care not to make it too damp. Use a strong backing, or, instead, double the India paper and pull it through twice.

Where a plate is in bad condition, or where it has been scratched or marked by rust, it should be first dried and afterwards rubbed well with powdered wood charcoal and a suitable piece of cloth. Besides this, the following method, though not particularly pleasant in use, produces some capital results. Completely cover the plate with fine charcoal powder and sprinkle a few drops of water upon it. Rub this well into the lines with the palm of the hand, turning about and rubbing it until the powder has worked perfectly dry; renew the powder and water again, and work well. Avoid any small pieces of grit in the charcoal which would scratch the surface. Then dry and gently rub in good olive oil or hog's lard, and after a twenty minutes' interval proceed as usual with the inking.

## The National Workmen's Exhibition.



HE Lithographic and Art Section of the Printing and Kindred Trades Group of the above exhibition is being run by the National Society of Litho Artists, of 52 Fleet-street, London, E.C., and there is every prospect of its being one of the most interesting and instructing shows in the exhibition, as in addition to the exhibits of the various printing houses there will be a collection of lithographs, engravings, &c., arranged to illustrate the progress and development of the art.

In furtherance of this object, Messrs. Vincent, Brookes, Day & Co. have kindly offered to lend some of their early specimens of chromo work which were produced in the "good old days" when good work was in demand and competition not so rampant.

Messrs. J. S. Virtue & Co. have also promised a loan collection of originals together with reproductions of the same. This should be particularly

interesting, as there is no doubt this firm can show some of the very best specimens of engraving dating from an early period. Many other firms also have promised to assist in this direction.

Although helping to make a good exhibition, this loan collection will not "pay the piper," consequently the National Society have to rely on the assistance of the printing houses of the provinces and London in taking space for the exhibition of modern work, &c. Some of the best firms have already had space allotted to them, notably, Messrs. Waterlow & Sons; Blades, East & Blades; Hazell, Watson & Viney; Farquharson, Roberts & Phillips; Arthur Armitage, of Nottingham; and many other large firms are favourably considering the matter, among whom are Messrs. W. H. Smith and Son; Gilbert, Whitehead & Co. (late Keep & Co.), who will no doubt exhibit.

The Lithographic and Art Section will contain about 7,000 square feet of wall and floor space, for which the National Society have incurred a heavy financial liability, so it is to be hoped that the printing firms will support them in this undertaking, as the exhibition is being held with the sole object of demonstrating that British work is quite equal if not superior to foreign work, and thus endeavour to infuse a little patriotism in the breasts of the British public and induce them to support home productions.

Should this result be obtained, it will benefit the employer as much as the workmen; it certainly will not be accomplished unless the employers co-operate with the workmen in order to make a good representative show; but whatever happens it will not be the fault of the National Society, who are doing their utmost to make this section a credit to the trade.

One of the chief features of this section will be an "ideal hoarding," to be composed of the best specimens of poster work, and by which it is intended to demonstrate that it is possible by the aid of thoroughly artistic posters and tasteful arrangement to make the hoardings an ornament to our cities, instead of a disfigurement as they are held to be at present.

Although the Artists' Society has undertaken this special section in the Arcade Gallery for the printing arts, they do not by any means confine their exhibits to the work of artists. The exhibits may be special printing productions, regardless of artistic merit, and it is in this freedom from exacting conditions that they expect a much deserved support. From the latest advices it appears that space is eagerly sought after, and the date for closing applications is near at hand.

It is also hoped that any printing firms who are unable to take space will at least subscribe towards the considerable expense of this undertaking, as it is manifestly unfair to expect the workmen to bear the whole of the burden, seeing that they are working for the good of all employers and workmen alike, and in this connection it may be stated that Sir Joseph Causton & Sons have already given a donation of £5.

The secretary of this section is Mr. James R. Little, National Society of Litho Artists, &c., 52 Fleet-street, London, E.C., who will be pleased to give every information desired.



## Crayon Drawings by the Mezzotint Method.

... III. ...

**I**N the notices on this subject extracted from the *Lithographers' Journal*, which have appeared in Nos. 8 and 9 of this journal, a number of implements have been mentioned. Some have been fully described and their mode of use explained, others have been left to the present notice for description. In both the flannel method dealt with in the first notice, and the "grainer" method of the second notice, it must have been apparent that there was no method given by which lights could be worked out similar to those made by a knife on a grained stone, or how the fine details of light could be added. These are singularly easy with the tools at hand. The fine details or outlines which require to be left in a mere half-tint should be sketched out with a point made of boxwood or ivory. If the details require to be white, or nearly so, then a steel point must be used.

The boxwood and ivory points should be similar in size to ordinary lead pencils, and kept sharp by using a file. The use of sandpaper is certainly very good, but the points must be sharpened in the same manner as a good gelatine cutter, so that they present some sharp edges by which the crayon is cut out of the stone and can be blown off. Should the points become blunt, the crayon will not be cut clean out and will remain all along the cut lines, shewing a black edge. If the whiteness of the ivory is objectionable, then use points made from brown horn.

In practice, these boxwood, ivory, horn, or whalebone points are used solely to remove the crayon. Those substances vary in hardness, and are used each in its proper place to cut out the crayon more forcibly. But they should not be used with such vigour as to actually scrape the stone. The scraping or cutting away of the stone is left for the steel instruments to effect.

Again, the nature of the original tinting should to a certain extent dictate which point to use. When the tinting is heavy, the boxwood point is suitable; when the tinting is thin, then the ivory point should be used. To work out these outlines or cross-hatchings in a mere degree of difference from the surrounding tint, use the boxwood point with a light pressure. The greater the pressure the more is the crayon cut out, and the harder the point the more likely is it to cut the stone also. The points can be used in either the flannel or "grainer" processes. But since the crayon in the latter is very soapy, care must be taken to work it perfectly dry. With greasy crayon tinting as in the flannel process, the tint may be breathed upon to give it a mere sensation of moisture, it is then more easily removed by the point; the boxwood or ivory point being quite hard enough to make almost clear lines. Damp, however, must be rigorously avoided with the soapy crayon used in the "grainer" process.

These tools are used to finish off the tint drawings, which have been worked out from an almost black background, produced as already described in the two previous notices.

The cutting or clearing tool is the scraper, which is a sharp steel scraper of sufficient length to give it a pliability to assist in the grace of the scratchings. It should be kept sharp, and in use may prove somewhat deceptive. It is advisable to wait until the remainder of the drawing is finished before using this tool, so that its real effect may be gauged with greater accuracy. The scraper is used solely to cut out the clear lights, which are to appear white on the print, and it is only with experience in this class of drawing that the artist can determine when the scraper has actually left what will become a white line in printing.

## Important Case to Lithographic Printers and others.



**T**HE first hearing of a case has just been taken, in which Mr. J. E. Baird, astistic stationery manufacturer, Kelvinbridge, Glasgow, seeks to restrain Messrs. Millar & Lang, artistic stationers, 13 Robertson-lane, Glasgow, from "manufacturing, selling, disposing of, or using any products made in accordance with the invention, and by the machinery and apparatus described in the specification filed relative to the said letters patent, and from either directly or indirectly making, using, putting in practice or vending the said invention in the United Kingdom of Great Britain and Ireland and the Isle of Man, and from infringing in any manner of way the rights and privileges granted by the said letters patent."

The plaintiff avers that he is the inventor of "improvements in and relating to embossing of designs, letters, figures, prints, or patterns in the terms of the specification," which was produced in proof. The said specification makes two claims, viz. :—

First. The herein described process or method of embossing or relief stamping designs, letters, figures, prints, and the like, by the use of stones, plates, or blocks, in cylinder lithographic and printing machines, substantially as and in the manner set forth.

Second. The embossing or relief stamping of designs, letters, figures, prints and the like by engraving in intaglio the parts desired to be in relief on stones, plates or blocks, and making up the pressing surface of the cylinder in relief to suit these, and emboss or stamp, previously printed lithographs in cylinder lithographic and printing machines substantially as and in the manner set forth.


It is needless to cite the specification, as the second claim conveys the gist of it. The manner set forth for embossing is simply the engraving in a stone of all parts desired to be brought out in relief. Then place the stone in the litho machine and get it into absolute register as though printing a colour stone. Such a course alone, with a thick blanket, would produce relief in the engraved portions, but the plaintiff further increases the power of obtaining relief by filling in the engraved stone with some composition (of paper, or paste, or plaster), and when filled a sheet of glued paper is carried slowly round by the cylinder, which takes hold of the fillings, and

transfers them from the stone to the cylinder. Thus the cylinder is "packed" to obtain greater relief. It is the same old style of packing which has been in vogue for years for the same purpose, and the defendants aver that the so-called "improvements in and relating to embossing of designs," etc., claimed by the plaintiff, were not a novelty at the date of the alleged letters patent, and were not capable of being patented by plaintiff, and are null and void; that the method of embossing described in the specification was public property, and in general use in England and Scotland [and Ireland—Ed.] before the date of the letters patent, and the names of certain well-known firms in Scotland and England were furnished by the defendants, who are said to have so used the process; and further, the defendants stated that anything they have done or are doing in the matter of printing, lithographing, etc., is quite within their rights.

Mr. Sheriff Guthrie, has appointed July 4th and 5th for the final hearing of the case. The solicitor for the plaintiff is Mr. J. L. Oates (of Messrs. Lindsay, Meldrum & Oates). The solicitor for the defendants is Mr. C. M. Campbell (of Messrs. Gordon, Smith, and Parker).

From the debate at this hearing it appears the whole case was narrowed down to one point, viz.: whether anyone had embossed in the same way in the lithographic machine prior to the date of the said patent.

## Resignation of the General Secretary of the "National" Society of Litho Artists.

E learn with considerable regret that Mr. Graham Winch, who for over three years has filled the office of general secretary to the "National" (London) Society of Artists and Engravers, has resigned that position from purely personal reasons. His resignation was received with the fullest expression of regret from the Society, which also held out to him further inducement to retain office, but his mind was made up, and he has relinquished a post which he has filled with honour to the Society and to himself.

In 1889 Mr. Winch first went into office as assistant secretary, and very soon after that appointment he brought before the Society the generous plan of presenting a testimonial to Mr. W. S. Beach (the original general secretary), and to also keep that gentleman at Ventnor during his illness, which unfortunately terminated in his death.

In 1890, when Mr. Winch had been elected as general secretary, he worked diligently with the committee to discuss the old transference schemes issued by both the "Amalgamated" and "National" Societies, and to formulate a scheme from them, which should be acceptable to both Societies. The "Amalgamated" Society had invited the "National" Society to its annual delegate meeting at Birmingham in 1890, for the purpose of arriving at a transference scheme, by which with as little formality as possible,

members could leave one Society and join the other, after they had removed from one district to another, and retain a position equivalent to the original position. Such a scheme was drafted and accepted in 1890, and it has worked most satisfactorily during its first three years of operation. In 1891, when there was an attempt to introduce a middleman system at the Harsard Union's Lithographic Department, the artists in a body were withdrawn, and the whole arrangements, negotiations, etc., were placed in the hands of Mr. Winch, with the result that the Society gained a moral victory, which rendered it impossible for the Union to obtain artists, at the same time drafting away those who had been withdrawn into good situations.

Last year, as the Society's representative, Mr. Winch attended the Conference of the Kindred Printing Trades, and the Trades' Congress at Glasgow. During the discussion by the London County Council on the question of reducing the billposting hoardings, followed by the extensive newspaper correspondences, Mr. Winch took an active part in defending the position of the trade. Ultimately, in a letter to the *Star*, he suggested the appointment of a censorship committee of billposters to regulate posting of placards, and make them conform to certain regulations to secure more careful and artistic posting. This suggestion was accepted, and has since been in actual operation, tending to make it a pleasure to look at the hoardings, in contrast to the dirty, miserable corners which can be found near the main thoroughfares of almost any large town. Again in 1891, when the "Amalgamated" Society of Artists, etc., held its delegate meeting in London, Mr. Winch and the "National" Society's Council laid themselves out in every way to give the delegates a hearty welcome and a most acceptable entertainment. Mr. Winch undertook all the arrangements for the other Society's delegate meeting, with every success.

It certainly seems a pity that Mr. Winch has retired just at a time when the Society is engaged in a progressive scheme for the establishment of a library and studio for Artists, and is busily engaged in working up the printing trades section of the forthcoming Crafts Exhibition at the Agricultural Hall.

There has been no one, perhaps, since the rupture in 1886 between the two Societies of Artists, etc., who has been more solicitous of the welfare and harmony of their parallel existences, than Mr. Winch; and the Amalgamated Society of Artists, etc., cannot help but recognise the very courteous way in which Mr. Winch has carried on the lengthy and intricate correspondences between them, always resulting in amicable arrangements.

WHY is it that photography is not ranked on equal terms with the highest flights of painting? It is because the function of the painter is not merely to present you with a scene and leave you, the spectator, to find your own emotions and draw your own conclusions; it is his business to stand—he cannot help standing—as an interpreter between you and Nature, and his rank and value will rise and fall in proportion as he does his work of interpretation well or neglects it.—COLLINGWOOD.



Printed with Mander Brothers' Lithographic Inks.  
On Smith & Mc Laurin's Celebrated Chromo Paper.

Works - Wolverhampton.  
Johnstone, Scotland.



Specimen of Chromo Lithography in 11 printings, drawn direct and printed at  
machine from plates Manufactured by the Patent Lithographic Zinc Plate Co. Ltd. Hull.

UT MONTFORT PRESS LITHO







## Zinc Plates as Substitutes for Stone.

**M**UCH has already been written concerning zinc plates as substitutes for lithographic stones, and in a previous number of this journal reference has been made to the different zinc plates now on the market, but the particular plate it is here proposed to deal with is universally acknowledged by lithographers as the best.

The patent lithographic plates of the Zincplate Company, Ltd., Hull, are prepared in a much simpler manner than any others offered to the craft, thus placing in the hands of the printer a material which requires but slight alteration in the modes of transferring and printing.

It is just this slight alteration, though, which trips up the average printer. He has served his usual six or seven years to his business, and overcome the many and varied difficulties attached to stone; then it may happen that he takes a situation with another house where these zinc plates have superseded stone. What is the consequence? He may be a good practical litho printer, but he has to suddenly throw off all his old ideas and adapt himself to a new medium for printing from. He fails, probably, as a consequence, and he blames the plates, not himself. But now reverse the position. Bring a man up entirely to print from plates. He may have heard of stone as something new, and he would ridicule it as some stone printers do zinc plates.

Our trials have proved to our satisfaction that if the same amount of care and labour which is devoted to the subtle nature of stone is given to plates, results not only equal, but superior, can and have been produced.

We commend to our readers' notice the accompanying view of St. Mary's Church, Leicester, lithographed in the De Montfort Press litho department, in eleven workings, from a water-colour by E. T. D. Stevens. This has been drawn entirely on zinc in our own studios, and printed throughout at machine from plates manufactured by the Hull Zincplate Co.; and the result is as good as anything from stone could be. The full edition (5,000) of THE BRITISH LITHOGRAPHER has been printed from re-transferred plates, and accompanying the finished picture will be found the yellow, the first colour printed, showing plainly the quality of the work, and the absence of tinting in the ink, which upsets so many printers. In the coming numbers of THE BRITISH LITHOGRAPHER all the separate workings will be shewn in their proper order, which may prove useful to members of the craft.

The somewhat dark grey colour of the plates may be an objection, but artists as a rule do not demur in the slightest to draw upon them.

A few hints may not be out of place here, so we will detail and describe the drawing, etc., of the

accompanying picture. The first difficulty which would probably show itself to the inexperienced would be that of obtaining satisfactory offsets for colour work. A good stout bright enamel chromo paper should be used, and the offsets laid down dry—not damp, as usually recommended. Be careful *not* to use turpentine. After the artist has his offsets all right, there is nothing to trouble him in their use; he can use all the known helps to his art, such as Day's mediums, etc., etc., just the same as on stone. As regards the proofing of the subject, many practical printers say they prefer proofing off the Company's plates. In the press finer proofs can certainly be got than from off stone, flatter in colour, sharper and more even throughout. No serious difficulties affect the prover; he, as likewise the printer at machine, has only to learn the use of the etching and preparing solutions manufactured by the Company for their plates, and apply them in much the same order and way as he would his acids and gums to stone.

Transferring is accomplished exactly as for stone, every transferrer that has come under our notice having ideas of his own, but all amounting to the same thing in the end. One thing should be kept well in mind: use the rubbing-up rag or sponge as little as possible. The transferrer should ink up with the roller carefully, pulling off one or two waste impressions, until he gets the drawing fully secure, when he can etch it in the usual manner.

It is at the machine where the greater difficulties show themselves, and the greatest of these is the tendency of plates to tint; but with care in the management of the quantity of water used on the plates this can in a large measure be overcome. Many ingredients can be placed in the water which will help to keep the objectionable scum off the plate, such as small quantities of vinegar, gum, sherbert, stale beer, etc., etc. Other difficulties may, as with stone, show themselves, but in the hands of the skilled printer all may be overcome by attention.

The foregoing remarks serve to point out that the plates do not require the severity of treatment accorded to stone, and the accompanying picture proves that, to say the least, as good results can be obtained from zinc as from stones.

The Hull Zincplate Co. are to be congratulated on the perfection to which they have brought their plates, and if the printer only gives them the same thorough trial and close attention which he has been compelled to give to stone, success will be assured.

MESSRS. S. CHARLESWORTH & CO., the well-known printers' engineers and machinists, Richmond Hill Iron Works, Oldham, forward a copy of their last catalogue, just issued to the trade. Apart from simply detailing the prices of their productions, an up-to-date catalogue of this character is of much use in shewing the later developments of machinery and what is being done to supply the wants of the printer. Descriptions of the litho and letterpress machinery, presses and various supplies provided by this firm, are found in their list, with full particulars as to prices and sizes. Those who have not as yet seen this catalogue should write for a copy and keep it at hand for reference.

# Lithographic Printing Machinery in France.

BY A. VALETTE.

## PART III.



HE distribution of ink by means of rollers and distributors, etc., is done in various fashions in lithographic machines, the most useful undoubtedly being that in which the ink duct charges a roller taking away the amount necessary for each impression.

Recent attempts in this direction have produced some very satisfactory results. The ordinary inker with its bearer is doubled, the first roller giving the ink to a second of a much larger diameter, and so arranged as to be continually turning, and as the inker communicates its ink to larger rollers, the ink is thus equally distributed over the surface. To give perfect distribution over the inking table the ink is further distributed by passing under the distributing rollers. The table, on moving under the various rollers, is found to be very lightly charged with fresh ink—a desideratum of the utmost importance.

Previous mention has been made of the methods, or rather the parsimony of the majority of litho machine makers. The generality of manufacturers keep in view not what is the best and most solid, but what is most expeditious, and the true value of the machines they produce is restricted by the situations they are to occupy, and the ever present endeavours to lessen the actual cost. With regard to the small amount of material employed, this is a defect against which the practical lithographer does not protest energetically enough. It is a fault which necessitates a number of large inkers, and in making the ink duct and accompaniments of an abnormally heavy and clumsy character, so that the least fault tends to make the whole set of inkers and distributors deteriorate.

The practice of the same parsimony causes the makers to omit the rollers against the cylinder, just at the point at which there is generally something to be placed between the carrier and the cylinder, making it impossible to guard the hands from being inked, though perhaps for this the makers are not to blame. Let manufacturers continue to improve the machine, increase the number of rollers and their diameters, diminish the weight of the distributors, and above all give solidity to their machines so as to avoid any rocking, shaking, and unnecessary vibration; give the utmost possible power to the impression; and observe the same care with minor parts, while retaining elasticity, and they will have earned the goodwill of lithographers.

## DAMPING.

For some time past many attempts have been made to provide a substitute for the damping rollers so much used in lithography, and the automatic damping method calls for special attention.

In 1879 a patent was taken out by Felder for an invention which he called the mechanical *humectographe*, and in 1880 a new patent by M. Precher—*mouilleur*

*alimentateur lithographe*. These have now become public property, and as a result a new automatic damper—the *Mouilleur-Genet*—has been put on the market. This damper is composed of bands of velvet covering caoutchouc placed between flat steel plates; there are three of these flat dampers, and they are flexible. They are placed loosely in the metal slots on the frame at the same place as the roller dampers. The damping table is covered with the same material as the flat dampers, and is indispensable for good roller work. These flat dampers are damped automatically by a roller placed in a trough on the fore part of the carriage, feeding and damping at each traverse.

This method possesses the following good qualities: uniformity of damping; economy of maintenance, material, and space; and above all the machine is comparatively silent.

Personally, I cannot commend the new method so far as the solid castings are concerned, and notwithstanding the numerous good qualities, I hesitate, for I recognise a fault which tends to counterbalance the good points. It may easily be understood that a large body of ink on the stone continually passing and repassing at the same place, very soon begins to grease the damper, and this defect is a very serious one. If the machine-minder does not watch every impression the lines of the work will soon become filled up and retransferring will be required. Roller dampers have several great drawbacks; one of them is the infernal din they make, and this is most disagreeable. But in spite of this, I believe that in the rotary movement there is less tendency to grease the stone than in the other methods. If the machine-minder takes the kind of work into account and uses proper care, he may easily obtain good damping. Again there is the facility of removing the dampers, so as to clean them from ink taken up from the stone during printing. I have frequently remarked that with some colours, the damping water supplied prevents the ink from being printed on the paper.

I have previously spoken of the ordinary points in the construction of our machines. For best work and colours the *point register* or the *automatic register* is more especially employed. Without depreciating the ordinary point which has done so much good work in lithography, I must commend the system used by those doing best and high priced work—that of the *point register* or *Viellemaud's automatic register*. Some technical details on one or the other of these two methods of registering may be mentioned as offering undoubted facilities in lithography.

The point register is, properly speaking, but a development of the ordinary point. This popular system consists of a thick needle, or better, a point  $\frac{1}{10}$ -in. in diameter, and in place of the ordinary needle eye an eye of the same diameter as the point at the side of the table which has to fit the moving needle. Before printing, the paper is perforated with a special tool at the two extremities and at the centre—the same diameter as the points, so that they may register without any difficulty. This system is very popular and of real service, so much so that many employers prefer it to the automatic register.

[To be continued.]



## Book Notes.

**“ELEMENTARY PHOTOGRAPHY,”** by John A. Hodges (Hazell, Watson & Viney, Ltd., London; 1/-), forms No. 7 of *The Amateur Photographer's Library*.

Avoiding anything like theory and the use of bewildering technicalities, the series of chapters are well adapted for the purpose of assisting the tyro in his endeavours to obtain proficiency, and being sensibly written and adapted for those who are supposed to be entirely ignorant of matters photographic, will prove a welcome ally. Much of the vast amount of photographic literature published at the present day is of little value to the beginner, and many of the handbooks intended for his assistance only have the effect of causing confusion. With this book, however, the charge of impracticability cannot be sustained, the information contained consisting of the details of actual procedure involved in the successful practice of the various processes used in present day photography. Illustrated and well arranged, the work may be well recommended to the large number of our friends who are wishful to take up the study and practice of photography.

“DRAWING AND DESIGNING,” by Charles G. Leland, M.A., F.R.L.S., forms one of the “Minor Arts and Industries” series (Whittaker & Co., Paternoster-square; fols. 4to; 1/-), and comprises a series of practical and sensible lessons in drawing, well illustrated and carefully graded. The author holds that anyone capable of learning to write may also learn to draw, and maintains that the present system of teaching requires skill in no small degree before ability to design is reached, necessarily tending to cramp the inventive powers. He has thus made a combination of drawing and designing, and in a simple practical fashion the lessons lead up to advanced outline decorative design, with capital hints and suggestions as to their practical adaptations to objects. While the idea is not new, it is not known as widely as it ought to be; and to beginners more especially the system, as shewn in this book, cannot fail to be of the greatest use.

THE just-issued “SUMMER TOURS IN SCOTLAND BY DAVID MACBRAYNE'S ROYAL MAIL STEAMERS” should certainly materially increase the number of tourists in the popular Highland district. The well-known MacBrayne holiday steamers form a portion of a fleet some thirty-six in number owned by Mr. MacBrayne, who also employs quite an army of agents and servants of various classes in the various tourist centres. The guidebook shews the enterprise of the firm, and is more than usually replete with the many items of information necessary to the comfort of the ubiquitous tourist. Perhaps to a greater degree than most holiday resorts do the Highlands lend themselves for the purposes of the painter and photographer in providing charming views, pictures of Highland scenery being always attractive and universally popular. This feature has been made the most of

in the book under notice, and quite apart from readable, well-arranged matter, useful maps, and numerous small illustrations provided in the text, there are a series of full-page views of well-known Highland scenery, which, being tastefully printed on good paper, give quite a tone to the book and additional interest to the matter. Any of our readers contemplating Highland tours should send for a copy of this handsome guide (6d.) from the head office, 119 Hope-street, Glasgow. If they have not made up their minds, the book will certainly help them to a speedy decision.

*The Technical World*, a new weekly journal of technical and secondary education (Whittaker & Co., Paternoster-square; 2d.), aims at being the medium of interchange between those engaged in this laudable work; and news of this character, proceedings of societies and officials, papers read, and general notes on advances made in various directions, are all epitomised in its first number. Portraits of well-known educationalists and illustrations of schools are also included in its pages. The increasing popularity of higher and technical education renders such a journal more than useful—almost a necessity, so that all officials, teachers, and students, would do well to give the new journal their active support.

## Photographs by Electricity.

PROFESSOR W. W. TACQUES recently described some experiments he witnessed in sending photographs over a wire by means of electricity. The laboratory consisted of two rooms; in one was an ordinary photographic camera, a small developing closet, and on a table in the middle of the room a cubical box, in one side of which was a slide of sufficient size to receive a postal card. From this box two wires stretched across the room to the partition wall, and passing through this, extended to a similar cubical box standing on a table in the middle of the adjoining room. I was given an ordinary postal card and asked to write a short note upon it, and wrote “Good morning! How do you do?”

My friend then took the card and placed it about six inches in front of the camera, where it was well illuminated by an electric lamp. Then he pressed the button of the camera, then took the plate holder to the developing closet, and presently reappeared with a hastily-made negative, which he dropped into the slit in the cubical box on the table in the middle of the room. I then went into the adjoining room, and there, issuing from the corresponding box on the table in the middle of the room, was a piece of thin paper the size of a postal card, on which appeared in facsimile the words I had written, “Good morning! How do you do?” There would seem to be no reason why the sending and receiving boxes, instead of being in adjoining rooms, should not be placed one at the end of the wires in one town and the other at the other end in another place miles away, and thus letters written in one city could be instantaneously photographed to the other, and beat the mail by six or seven hours.—*Ex.*

## Specimens.

*[Will our friends kindly remember to send their specimens either TIGHTLY ROLLED OR FLAT BETWEEN BOARDS; the cost is but a trifle more, and for review they gain in being presented as they come from the machine. If sent unprotected, specimens are usually so crushed and disfigured as to be utterly unfit for criticism or preservation.]*



HERE was recently a unique and imposing ceremony at Windsor, when Her Majesty the Queen inspected the Derbyshire and Notts. Companies of the St. John's Ambulance Association, formed amongst the colliery workers of Colonel Seeley, the occasion being a general holiday in the royal borough. A full report appears in the *Alfreton and Belper Journal* of May 12th. Messrs. Rowbottom & Son, of Alfreton, were honoured with the order for the printing and for a special illuminated programme for the use of Her Majesty, the latter of which they placed in the hands of the De Montfort Press. The programme, which consisted of four small 4to pages, was designed by E. T. D. Stevens, and illuminated in dainty colours, gold, and tints, on vellum. On the first page appears the badge of the Order, with the announcement of the inspection. At the side stands a cavalier holding aloft the royal standard, and surmounting the badge of the Association is a view of St. John's Gate, Clerkenwell, part of the old priory and now the headquarters of the Central Association. At the foot of the title-page were portraits of the prior of the Order as existing eight hundred years ago, and the more military looking leader of the movement at the present day. On the other pages was the programme descriptive of the arrangements in connection with the royal review, the whole carried out in a charmingly free and artistic manner. The programme forms an elaborate souvenir of the event, and was handsomely bound in green russia, lined with silk, with appropriate gilt ornamentation on the outside. Her Majesty carried the programme in her hand and frequently referred to its contents.

MESSRS. MILLAR & LANG, of Glasgow, have forwarded specimens of their Christmas cards for 1893, and some of their novel high-class stationery. The specimen book of Christmas cards contains some hundred different designs, all of which have been designed and produced at their establishment in Glasgow. Such a statement carries with it far more than at first appears, because these cards have a style and finish about them which has hitherto characterised only the highly appreciated Continental cards which have flooded the British market in the past. The cards are made in all shapes: square, slightly oblong, long oblong, self-supporting, and the pretty booklet. Most of the cards are three folds, with every conceivable shape to the outer fold, whilst with one or two exceptions the cards are all deckle edged. Nothing is wanting in the designs, which vary from pale floral ornament, or lettering, to very rich ornamentation—mostly floral with horse shoes, birds, the Scotch cap, calendars, the sickle, pretty landscapes—and tasteful lettering. One series of self-supporting cards is decorated mainly with figures—the Highland dancer,

the piper, the golf player, the fishwoman, the cyclist, the forester. But the feature of the whole series is the excellent finish put on by embossing. In all the cards the flowers, lettering, and figures are brought out in strong relief, whilst borders are worked on the cards solely by embossing. Again the general surface of the card—sometimes all over, sometimes on the two laps, and at others on the centre lap only—is broken up by well-chosen patterns, such as fine crocodile, irregular network with floral bosses, etc., evenly embossed, and giving the cards a high finish.

The booklet cards are very tasteful. They are made with an inset, which is tied in by a silk cord or tape, and is in itself a pretty Christmas card, printed and finely embossed, and bearing the printed greeting for the autograph. This inset is, of course, on a thin good paper. The covers are all prettily ornamented, and chastely embossed; with one exception they all have the deckle edge. Many of this excellent "National" series, are hand painted, which to the practised eye will be discernible in the mellow unevenness of the washes, which give such a charm to this much admired season's fancy goods.

The stationery samples are made up in the usual boxes, some of them bearing designs and lettering, giving a key as to the contents. The Princess Ida box is a mellow toned paper, with birds in gold relief, and nice wallet envelopes. The other specimens are all deckle edged, of which, probably the most novel is the Arabesque Mourning, with its pretty narrow black deckle-edged wallet envelopes. The new "Willow Pattern" paper is printed all over in a very pale shade with the well-known willow pattern, and the box itself is a facsimile of an oblong dish of the same pattern, relieved by heavy embossing.

The "Eau de Nie" (Roumania), "Old Egyptian Papyrus" and "Arabesque" (the latter dedicated "Princess Maria"), are mainly distinguishable by the ordinary small commercial shape envelope, being made pocket fashion, with a lap reaching more than three-fourths along the envelope. These three envelopes are respectively plain, gold bordered, and coloured bordered, upon a deckled edge. The papers are similarly treated.

In all this stationery and fancy card production, the embossing has apparently been done from stone, a process which is at present the subject of a lawsuit against the firm.

ONE of the prettiest souvenirs of the Columbian World's Fair is a set of eleven dainty water-colour sketches of the twelve principal exhibition buildings. They are beautifully executed by the Orcutt Company, one of the leading lithographic firms in Chicago, and as they are of a size suitable for framing, will no doubt have a ready sale, not only amongst visitors, but the public at large. The entire set is sold at sixty cents (about 2/6).

THE MANCHESTER DRAWING CO. send us, as a specimen of their capabilities in fine work, their own business circular, which is a very commendable example of both plain and fancy lettering, as well as artistic and free ornamentation, and it is excellently printed. Better work could not be wished for.

Printed with Mander Brothers' Lithographic Inks.  
On Smith & Mc Laurin's Celebrated Chromo Paper.

Works - Wolverhampton.  
Johnstone, Scotland.



Specimen of Chromo Lithography in 11 printings, drawn direct and printed at  
machine from plates Manufactured by the Patent Lithographic Zinc Plate Co. Ltd. Hull.





## Notes and Queries.

**I**N reply to "A.B.A.," Peterhead, we do not quite see the point we are required to explain. Newspapers as a rule are illustrated by line or half-tone blocks, and not by any process of lithography. But if drawings are produced on stone, then the litho printer must transfer them to zinc, previously washed over with the Hull zinc plate coating composition. After transferring, they must be well rolled up and satisfactory proofs pulled, before putting the work into resin and etching the zinc down to leave the work in relief to make a type block of it. There is nothing difficult in this to any litho printer. The etching can be done by placing the zinc plate in a dish, sufficiently deep to allow a weak solution of nitric acid and water to cover it. When in the solution, the dish should be gently rocked to produce a wave across the zinc. The etching must be done little by little. After about five minutes etching, the plate must be removed, washed out, rolled up again, dusted with resin, warmed and etched a second time. The same process is gone through some four or five times. Finally, the plate is rolled up in a stiff ink, with a glazed roller which just catches the surface of the relief only, thus leaving the inclined sides of all lines bare. In this state it is etched, to fine down the lines, and a printing block is produced. A little experience will soon suggest where failure crops up, and how to remove the causes. The etching solution should not be stronger than "acid to taste." The zinc plates can be obtained from Messrs. Winstone, Shoe-lane, London.

REPLYING to Mr. James, of Worcester, whose letter comes too late for us to enter upon the subject in time for this number, we can assure him and the trade generally that the subject of transparent papers for shining up, and good retransfer inks, shall in due course be most thoroughly dealt with, and we hope will meet the requirements of all concerned.

AN enquiry from Mr. H. H. Elson, of Hull, shews that he started on a wrong basis. In the first place, when photo-litho transfer paper is prepared, it must be dried in the dark, and kept there until required, but not longer than two or three days. Secondly, to use a gauze in the printing requires an extraordinary amount of skill, for the gauze allows light to get all round and under the meshes, and does not produce a sharp image, whilst the exposure has to be most carefully watched. Your experience in its use shews that the print was either under-exposed, or your paper had lost its sensibility. We should recommend you to experiment at first with a good line negative only, and if you do not succeed, let us know your points of failure. Manipulators at present scarcely ever use a screen under the negative in printing, but use the screen in the camera, and produce the broken negative first. Again, half-tone lithography is too difficult for any amateur; men of long experience have not

succeeded in it. It is only in very few instances that any good work has been produced. The book we recommended on the subject has undergone a later revision, but you can rely upon THE BRITISH LITHOGRAPHER for publishing every known process and every new invention.

WE would recommend "Litho," Birmingham, to read over several past answers to queries on the same subject. The great fault in bronze printing is that it is put on too heavily. When black has to come upon it, the bronze preparation should be just bare enough to catch the bronze, should contain some of Manders' pomade, and the bronze dusted on as thinly as possible to cover properly. We may say that your difficulty is the universal difficulty, and there are very few who succeed in getting really good results.

IN reply to Mr. Hall, of London, the red—common lake—of which he sends a sample, is of the same nature as most such lakes. It is in all probability a cochineal lake, and like nearly all lakes derived from that source, will dissolve out of the ink by the constant taking up of water from the stone. It will stain the stone and dampers. Whenever tallow or other hard grease such as stearine is added, it seems to cause the ink to adhere in a body to both the slab and rollers, and, of course, the work is never properly rolled up. Ultimately, the caked rollers destroy, by mechanical abrasion, the work on the stone. What is wanted at this stage is to sprinkle rollers and slab very lightly with glissol. Or, in originally preparing the ink, add a small quantity of Manders' pomade.

AGAIN reverting to the question of embossing from the litho stone, referred to by correspondents in Glasgow, we are able to state that a firm in London has been practising it, not only to emboss paper, but for the direct purpose of printing *and embossing* tin tablets for several years past. Embossing of lithographic prints has been done at Messrs. Robinson's, of Bristol, to bring out all the high lights of their chromo almanacks as far back as 1881. The embossing is very sharp in these chromos, and is produced by packing the cylinder. Messrs. Walker, of Dublin, embossed very fine borders in their tickets fifteen years ago, from the stone and by packing the cylinder; and Messrs. Blacklock, of Manchester, have for a number of years used the self-same method to emboss their calendars. We are still quite unable to see how any firm can claim a patent for embossing in the litho machine by packing, during the last two years, and we trust that the trade will come forward and express its opinion freely on the matter.

IN reply to "J.W.P.," Hull, and "G.M.S.," of Holloway, we may say that the printing of music from zinc plates is by no means common, and singularly enough whenever it is attempted recently we get enquiries from those who take it up as a new art. In our next number we purpose publishing an article upon the subject from one having had considerable experience in it.

REPLYING to "Copper Etching," of London, the film of gelatine must be made to adhere by using a substratum as already described in our articles on collotype; the albumen substratum for preference. Canada balsam must be thinned by heat, must be used warm, and everything must be warm which it comes in contact with. It is this difficulty which enhances the price of the sealed screens now being imported from America, and largely used in this country. You will find some information in Mr. T. Wilkinson's book on "Engraving and Collotype" upon the use of bichromatised bitumen; and further particulars can be found in a book on "Etching," by Carl Schraubstadter, jun., of St. Louis, U.S.A.

IN reply to Mr. Herring, of London, the sandblast machine was made the subject of a patent some eight years ago, and we believe that the same pattern of machine is used by the zinc plate companies for sandblasting all zinc plates before preparing them. The machine is very different to that used by glass embossers, and consists mainly of a large drum, upon which the plate is fastened whilst it is exposed to a steady pour of sand from a number of nozzles. The Hull Zinc Plate Company might undertake the graining for you.

REPLYING to Mr. Mason, of South Shields, the best work published, of which we have any knowledge, is the eminently practical work by Carl Schraubstadter, jun., of St. Louis, U.S.A., on zinc block etching, etc. Second to that is the work by Mr. W. T. Wilkinson, London, on collotype and photo-engraving.

IN reply to a number of enquiries on zinc etching, the process in common use in this country for sensitising the zinc is by bitumen. There are firms, however, who have apparently introduced the albumen process from either Germany or America, in both of which countries it has superseded the bitumen process to a large extent.

The albumen process consists in taking the white of one egg, and, removing the germ, beat it into a froth. Half an ounce of dry egg albumen may be used, but it is more expensive and less satisfactory. Prepare a solution of eighteen grains bichromate of ammonia in eight ounces of distilled water, and add it to the beaten albumen, or dissolve the dry albumen in it. The liquids are mixed by beating together, or in the well-known way of shaking them up in a bottle with pieces of broken glass in it. To this may be added a few drops of strong ammonia solution. The mixture is then filtered through a tuft of cotton wool placed in a funnel, and allowed to drain down the inside of another bottle to avoid dripping and forming bubbles. In a few hours the solution will have settled down evenly, and be ready for use. This preparation goes bad in a few days, and must be made at least every three days.

After the zinc plate has been grained in the acid bath, it must be washed over and over again until water flows evenly over it, shewing that all grease has been removed. Should there be any grease on it, replace it for a moment in the etching bath; or dab

the surface with a tuft of cotton wool saturated with ammonia solution. After either course the plate must be again thoroughly washed and allowed to partially dry. The plate must not be allowed to dry before the sensitising solution is poured. Sensitising is performed in the dark room. The plate is held at a slight inclination, and the albumen solution poured on at one corner, resting the mouth of the bottle on the plate to avoid bubbles. Always pour on more solution than is required, and pour off the surplus. Pour a similar quantity on two or three times, and pour off the surplus, leaving the required thickness of film on the plate. If bubbles occur during pouring, then pour on more solution to wash them off, and do not proceed until all bubbles are removed. Both during the action of pouring and the subsequent drying, the plate should be kept at the same angle. The drying is done over a stove (gas or oil) and not over a lamp. The plate being held by the fingers it will be soon apparent if the heat is too great. This is the surest way to obtain successful drying, for when the heat is too great for the fingers it is also too great for the albumen. During pouring and drying the surplus solution is removed as it collects at the edge, by blotting paper. The drying must not be forced, but allowed to go on gradually from the top edge of the plate downwards. The plate is, when cool, ready for exposure.

THE NOTTINGHAM AND DISTRICT FEDERATION OF PRINTERS.—A smoking concert was held in the Mechanic's Lecture Hall, on a recent Saturday evening. The chair was occupied by Councillor H. H. Adams, supported by Mr. John Read, president, and the following members of the council of the Typographical Society of Nottingham:—Messrs. W. Allen, Payne, Shipman and Watte; Messrs. E. Stevenson, Pagdin and Adcock, of the Lithographic Printers branch; Messrs. Falconer and Franz Ludwig (secretary), of the Lithographic Artists' Society; and Messrs. G. Robinson (Trimmers), S. Bower (Rotary F. W. K.), H. Staton (Tailors), Meats (Tool-makers), etc., of the Trades Council, making an audience of 250 representatives and friends of the the various trades, to enjoy the excellent programme which was presented. Mr. T. Farnsworth, who accompanied the singers in excellent style throughout, opened the proceedings with a pianoforte selection. Mr. Will. J. Stennett sang two songs which suited his voice admirably. Pinsuti's "Queen of the Earth" and Watson's "Thy Sentinel am I" were dealt with in a finished style by Mr. C. Schnider. Mr. J. Asher joined Mr. Townsend in an effective duet, and the former also gave "The Bugler," and "Bill the Bo'sun." Mr. Frank White contributed "The Storm Fiend," and the humorous element was well sustained by Messrs. W. J. Winslow and W. Rouse. Mr. J. E. Jones (Birmingham) was warmly applauded for Sullivan's "The Sailor's Grave." Violin solos by Miss Jennie Tait and Mr. J. Rauch were well received, and Mr. Allen, in a clever legerdemain performance, completed a thoroughly enjoyable evening, which as a concert and as a means of bringing artizans together was a grand success.



## Trade Reports.

(From our Special Correspondents.)



### DUBLIN.

WE regret to announce the death of Mr. John McCann, who was our agent in Dublin. His demise is much regretted by lithographers, as he had for many years held the position of secretary to the Society, fulfilling his duties with ability, and earning the respect and admiration of his fellow craftsmen. The funeral was largely attended and thoroughly representative in its character. Wreaths from Messrs. Cherry & Smalldridge, the Litho Artists' and the Litho Printers' Societies, Mr. and Mrs. Ballantyne, and many other friends, were placed on the grave. Deep sympathy is felt for the bereaved widow and family.

### DERBY.

TRADE is still very quiet in most departments, the Society reporting two members as being still unemployed. The collotype branch is perhaps the best occupied.

THE local paper previously mentioned as published in the interests of the workers of the district, *The Labour Journal*, has now reached its seventh number, and contains news and comments on labour movements both in the immediate district and further afield.

### LIVERPOOL.

TRADE in Liverpool has been very dull during the past winter and spring seasons, but has evinced a change for the better during the present month.

WE regret to have to announce the failure in business of Mr. Sidney Wood, of College-lane, who has been established for some years as an artist and litho printer. The plant was sold by auction on the 10th, 11th, and 12th of May, very moderate prices being realised—for instance, one machine, royal size, was knocked down for £3 10s.; also a press, 14-inch, went for 6/-.

THE old and well-known firm of Messrs. D. Marples and Co., Ltd., have dissolved partnership, but we understand that the business will be carried on by the head of the late firm, Mr. Josiah Marples, and his son, with an almost entire new plant. We wish them every success.

**SATURDAY HALF-HOLIDAY AND HOW TO SPEND IT.**—The members of the "Social and Mutual Benefit Club" in connection with the litho department of Messrs. Geo. Philip & Son, Liverpool (Mr. J. P. Jennings, chairman) held their country ramble on Saturday, May 13th, being the first of a series of three during the year. The road taken upon this occasion was by way of train to Neston in Cheshire, arriving at Neston at 2.50. The weather was most beautiful—clear and bright. The road taken for the ramble was from Neston to Capenhurst, by way of the beautiful old-time village of Little Ness, and on to Burton, a distance of a little more than two miles, rambling through Burton Woods to the village, where the party obtained a privileged view from the tower of St. Nicholas' Church of the

surrounding country, the most notable sight within view being the river Dee, which divides the Cheshire and Welsh coasts, the Welsh hills forming a grand background. After feasting the eyes an adjournment was made to the "Old Mill Farm," where full justice was done to a substantial tea and the journey resumed at six o'clock, continuing on the road to Puddington, through Shotwich into Capenhurst; then refreshment and train, *via* Hooton and Mersey tunnel, arriving in Liverpool at 9.50, all highly delighted with their ramble of about 8½ miles through a beautiful country of ever-changing scenery, the river Dee being in view most of the way.

## Technical Classes.

### LEICESTER.

THE technical class in lithography closed its season's work by the examination, held on May 3rd last. Out of 25, 17 presented themselves—7 for honours and 10 for the ordinary grade—the examination being conducted by Mr. F. Keightly, Mr. T. B. Widdowson, the secretary, and the usual superintendents.

The questions were considered on the whole fair and thorough, and apparently well covered by the lessons so thoroughly given by Mr. S. D. Hall, of Derby (the instructor). Perhaps exception may be taken to two of them. In Question III. (honours), which reads: "Describe the advantages of electric lighting as applied to a lithographic workshop, and the difference between 'arc' and 'incandescence' lamps, and their respective merits in relation to colour printing," although it is generally considered that the use of the electric light is a great acquisition in a lithographic workshop, yet the information asked for in the question was decidedly outside the reach of the City and Guilds of London Institute syllabus. Also Question V., which states: "Suppose an architectural drawing is marked as being drawn to a scale of an inch to a foot, how must it be marked after it is reduced to one half the area?" is also not amongst the requirements of even the advanced litho printer, technical or practical, and its solution requires a good knowledge of mathematics.

These anomalies occur in almost every set of questions sent forth by examiners, and it is certainly to be desired that at the technical examinations, questions should at least be based on the syllabus set forth for the guidance of the teacher and ensuring a comprehensive course of lessons.

*The Phonogram* is the title of a new penny monthly "devoted to the science of sound and recording of speech." As this implies, Edison's phonograph and kindred subjects inspire the contents, resulting in a chatty and highly interesting journal.

LITHOGRAPHERS will no doubt be pleased to hear that the able general secretary of their Society at Manchester, Mr. G. D. Kelley, has been appointed labour correspondent for Manchester. A better man could scarcely have been chosen.

## Trade Notes.



THE action taken by the London County Council, in November of last year, in causing all billposting boardings within their jurisdiction to be reduced to twelve feet high, has given rise to a spirited newspaper controversy, and has caused no small amount of alarm amongst printers and billposters alike as to their destiny in the great business of making and posting the mural advertisements which find so many people constant employment. Perhaps the subject has been taken up with greater vigour by Mr. W. Hill (of Messrs. Walter Hill & Co., the extensive London billposters) on behalf of billposters, than anyone else, and he has published a pamphlet which clearly shews the great difference between the appearance of well conducted billposting stations, and the miserable patches of ruins and vacant spaces which are prohibited from use by billposters. His efforts are well intentioned, and he deserves the hearty support of the whole printing industry, seeing that about fifty thousand people, including artists, letterpress and lithographic printers, machine minders' ink and paper makers, are concerned. Add to this that the wages of these artisans, exclusive of letterpress printers and wood engravers, amounts to no less than £80,000, and the magnitude of the decision will be more readily understood. The County Council has aimed at beautifying London, irrespective of the injury done to trade at a time when the business of the country is at its lowest ebb, and no signs of improvement in the near future. It would have been better had they left well alone, or have delayed their action to a more opportune moment.

WE would draw attention to an announcement on another page relating to the Patent "Tenax" Suspending Clips, which may be described as a contrivance combining the advantages of a good labour-saving apparatus with the utmost simplicity. The clips are for use in all sorts of drying lofts, and are specially adapted to the requirements of the papermaker and lithographer. It is claimed for them that labour in this direction is considerably reduced, sheets are unmarked, wrinkling is obviated, and economy of space effected. In the next number we intend giving an illustrated notice of the clips based on our experience of them, but our friends would do well to write to Mr. Schery for particulars.

THE supplement in our last issue shewing "Colour Formation" naturally attracted a good deal of attention, both as a useful colour chart illustrating the article "What is Colour," and as a good specimen of printing inks. As mentioned at the foot of the design, Frank Horsell & Co., Ltd., of Leeds, supplied the inks used, and the freedom with which these worked, and their generally satisfactory substance and colour, gained golden opinions from the printers. Those who have not yet tried this firm for litho materials, zinc and plate printing inks and sundries, should send for their lists.

MESSRS. F. KÜHN & CO. inform us that they have on hand the sale of an invention in connection with the collotype process, viz., natural colour printing (in three colours) from prepared collotype plates. The specimens are produced by three photograph takings, and printed from Schmiere, Werner & Stein's collotype machines. No further particulars of the process are yet to hand, but we hope to be able to go into details in next number.

## Rumoured Revolution in Lithography.

THE New York Times had an article in its columns not long since, stating that a certain invention by Mr. Albert Grignard (of the Department of the Interior) had been sold by him to a New York corporation for nearly \$1,000,000, together with a royalty on all work done by his method. It was also said that the invention would revolutionise the lithographic industry, was of the greatest magnitude, and would affect the operations of every concern in the business. The nature of the invention was thus described: "A perfectly toned picture, embracing from fifteen to eighteen colours in its composition, from one or at most three impressions, whereas it originally required one impression for each colour so used." It would seem from this suspicious phraseology that the invention was no more than an adaptation of heliochromy. As we have been entirely unable to ascertain thus far anything definite of the inventor, the corporation purchasing the patent, or the invention itself, we prefer to express incredulity as to the possibility of such a thing, hoping by the time of the next issue to have something definite to present in the connection. It is extremely improbable that any such achievement will appear during this decade at any rate. There are only two ways in which the invention could be worked: one by the aid of a special machine, the other by the aid of photography. The difficulties in the way of the former, such as the slowness of drying in the impressions, and the mechanical obstructions to perfect register, are sufficient reason for scepticism, while if dry colours are used there are equal obstacles to success. The possibilities of photography are also extremely limited when "perfect tones of eighteen colours" are aimed at.—*Lithographers' Journal*.

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## Our Second Volume

### IS COMPLETED



WITH this number, and again we thank most heartily our ever-increasing circle of subscribers for the support they have given us during the past year. The complimentary letters we have received, and the largely increased subscription list, show that we are pleasing the majority; and in the future we hope to make the journal still more useful to the trades it aims to represent.

The present "special" number contains some first-class work by both artists and printers, the frontispiece and title-page for the completed volume being especially fresh and tasteful in design and thoroughly well printed.

A new departure is made in this issue in giving a short description of the various supplements. This we shall continue to do, as by this means some useful knowledge will thus be imparted to the younger, and possibly also to the older, members of the craft. There is still much ignorance prevailing with regard to processes outside of ordinary methods of working, and especially as to the cost of producing certain classes of work.

As regards the next volume, several new features are in preparation. It is intended to reproduce from time to time high-class statuary and figure studies from life, and a long-felt want will be supplied by giving in each number the arms of the counties and the more important towns in Great Britain; these will be drawn in black and white, with instructions as to the correct colouring, and will, when completed, form the most complete and concise book of arms for artists extant.

Other new features will follow in due course, and we have no doubt but that our subscription list—already close upon 5,000 strong—will continue to grow, and thus enable us to continue the high standard of excellence which it is our constant aim to attain.



### Our Supplements.

THE FRONTISPIECE FOR VOL. II., which is presented with this number, is lithographed from a water-colour sketch executed entirely with the air brush. Day's mediums have been very largely employed in obtaining the necessary soft effect. Twelve printings have been used in this supplement, and they have been printed in the following order, viz.: yellow, buff, light blue, light pink, second blue, second pink, light grey, dark blue, dark red, light brown, dark brown, and dark grey. This picture has been printed with Messrs. Mander Bros.' inks, from retransfer stones, on Messrs. Smith and McLaurin's celebrated No. 211C chromo paper.

THE TITLE PAGE also presented in this number is a distinct novelty in design, and we hope will be found useful as a suggestion in the use of the present revival of "Rococo" ornament. It has been reproduced by stipple, and printed in the following order: bronze yellow, buff, dark red, light blue, light pink, second pink, light grey, dark blue, light brown, dark brown, and dark grey. This subject has been printed with Messrs. Mander Brothers' inks, from retransfer stones, on Messrs. Smith & McLaurin's celebrated No. 211C chromo paper.

These two supplements will, we feel sure, be appreciated by the craft, and form a fitting title page and frontispiece to the second volume.

"SNAPS AND SNARLS" are shewn this time in a very striking and novel combination of colours—violet, green, and red; the idea being to illustrate the new theory of primary colours, just now strongly insisted upon by our brother craftsmen across the "herring pond." The old idea of red, blue, and yellow being the correct primaries bids fair, over there at least, to give way to the newer scheme. Order of printing: red, violet, and green; drawn on transfer paper with the brush, and printed from retransfer stones.

THE "HEAD OF LORD TENNYSON" and the plain supplements accompanying it, shewing the successive workings of the complete picture, and executed entirely with Day's shading mediums, are an entirely new departure. Portraiture on such a small scale has hitherto been considered as outside the possible utility of the shading mediums. Each stone has been a study of considerable ingenuity in the drawing, and the whole of the transferring and printing has been executed with the greatest care. The following is the order of printing: yellow, flesh, red, first grey, second grey, first brown, second brown (the best results being in this case obtained by printing the two shades of each colour following each other).

As an auxiliary in the artist's hands, Day's shading mediums are without a doubt indispensable, and no lithographic studio can be considered complete without them. All information about them may be obtained from the sole agent, W. O. Felt, of 9 Southampton-street, High Holborn, W.C.

The whole of this special supplement has been printed with A. B. Fleming & Co.'s (Ltd.) lithographic inks, on H. & L. Slater's (Ltd.) well-known "Star" enamel paper, from retransfer stones.

"CIOCIO," a characteristic head of an Italian donkey boy, is a facsimile reproduction (in nine colours) from a water-colour sketch by a celebrated Italian artist, D. Pensenti. This has been executed by hand-stipple, and with the aid of Day's mediums, for Messrs. Mander Brothers, as a special advertisement for their lithographic inks, and we think it is well done. It has been printed from retransferred stones in the following order of colours: yellow, flesh, red, light blue, pink, dark blue, light brown, dark brown, dark grey.

OUR "EVERYDAY" SPECIMEN for this number is a reprint of two of our ordinary business cards, each in three workings. The designs are novel, that of the bookbinding card especially so, and both giving our



Printed on the STAR CHROMO ENAMEL PAPER, Manufactured by  
MESS<sup>RS</sup> HENRY & LEIGH SLATER, Limited, Bollington, near Manchester, CHESHIRE.  
Warehouse: Dantzic Street, Manchester.

PRINTED WITH A. B. FLEMING & CO<sup>S</sup> CELEBRATED LITHOGRAPHIC INKS.  
Works, Caroline Park, Edinburgh.



"THE LATE LORD TENNYSON"

Specimen of Chromo Lithography in seven tints.  
*Executed entirely with Day's Shading Mediums.*  
Sole Agent. W. O. Felt, 9 & 10. Southampton Street, High Holborn, London.



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idea of economical yet effective and attractive commercial work in a few colours. This supplement is printed on H. & L. Slater's (Ltd.) celebrated "Star" enamel paper.

"ODDS AND ENDS" shews a full page of useful bits of ornament which we hope will meet a want; many artists have asked us for this, and if the whole of the sketches are kept which appear from time to time, a good collection will be the result. Head and tail pieces, borders, corners, etc., will in due course find a place amidst this collection. The supplement was photo-lithographed from a pen and ink drawing, and is printed on Messrs. Grosvenor, Chater & Co.'s celebrated "Acme" paper, from retransfer stones.

Two of the colours printed in the Hull plate supplements presented in the last number are also shewn, being the buff and green. These supplements were printed from the company's plates, at machine, from retransfer plates. The remainder of the colours used in the picture will appear in due course, and the whole collection should be of some service to artists and printers. The subject was printed in the following order: yellow, buff, green, dark red, light blue, light red, light grey, dark blue, light brown, dark brown, and dark grey, each colour being drawn on zinc and retransferred again on to plates for machine, and printed with Messrs. Mander Brothers' inks, on Smith and McLaurin's celebrated chromo paper. The single colour impressions are intended to shew the class of work used in the picture, and the manner in which they print from retransferred plates.

HAVING thus shewn that we are constantly "on the jump" to improve the character and contents of THE BRITISH LITHOGRAPHER, we may fairly ask our subscribers to assist us by using their best efforts in making it known amongst their friends and securing their subscriptions. If every present subscriber secures for us only one additional supporter our hands will be strengthened, and the means provided for making the B.L. an ideal lithographer's journal.

WE desire to call special attention to the series of supplements in this number illustrating the advantages of the use of Day's Shading Mediums. These valuable accessories to a lithographic establishment are now so well known that it is perhaps scarcely necessary to describe them very fully. The supplement in question is the portrait of the late Lord Tennyson, lithographed in seven workings, the whole of the tints being manipulated entirely with these mediums. Portraiture on such a small scale is no easy matter in ordinary stipple work, and it has always been thought outside the possible range of the mediums. This portrait has been produced in the small number of seven workings, ten or even eleven being usually employed to produce an equal effect. By a careful study of the plain sheets presented with the finished copy, it will be seen at once that the work is exceptionally fine and artistic in the values of the lights and shades and tones of colour. It is this fact that allows of fewer workings being used; the yellow in the beautifully soft gradations of colour on the face, and the light grey and light brown as drawing stones, amply

illustrate the value of the process. The whole of the specimens have been printed from retransferred stones, which speaks volumes for its retransferring and etching qualities. In fact, the mediums are applicable to all classes of work, and as these specimens show, are capable of really practical and artistic results. Then again, their manipulation is simple and rapid, and they can be used in connection with either the pen or crayon, and will work just as easy on zinc as on stone, grained or polished. Their transparency is a valuable feature, allowing outlines and offsets of drawings to be in constant view through the film. The gelatine films are stretched on frames with removable hinges adapted to any size of frame, so adjusted as to enable the operator to place it just where required. The same mechanism allows for shifting the film and increasing the tones in the same stipple or tint, and facilities are provided for combinations producing a large variety of texture. The set of films supplied produces over one hundred tints in line, stipple, grain, and other textures, which can again be used in an endless variety of ways. The process is, therefore, capable of extensive adaptation, and now it is proved that even portraiture can be done in such a perfect manner, it can be said, and truthfully, that by its means anything may be achieved. Full particulars may be had of Mr. W. O. Felt, the sole agent in this country, whose address appears on another page.



WE are not disposed to claim much for our own lithographic department yet—it is scarcely twelve months old—but we think we have some reason to be proud of the position—third—competent judges have awarded us at the National Workmen's Exhibition, especially in competition with such well-known firms as Reid, Son & Co. (first), W. H. Smith & Son (second), Farquharson, Roberts & Co. (fourth), and Blades, East & Blades (fifth). So far, ours has been all small work, and we have had no opportunity of trying our strength on large and important subjects, as have the firms mentioned, but the results of this competition have shewn us that we are on the right road, and encourages us to aim at a still higher position.

## Embossing from the Lithographic Stone in the Machine.

BAIRD & MILLER AND LANG.

AS announced in our last issue, the action in the question of a patent right claimed by Mr. Baird, for embossing from the litho stone in the machine, entered upon its second phase on July 4th and 5th, before Mr. Sheriff Guthrie. Additional evidence was heard on both sides, and at the completion of the sittings it was found that there was still a mass of evidence forthcoming, so to meet the exigencies of the case it was again adjourned to October. Amongst those who gave evidence were Messrs. Baird, Millar, F. Bott, and Messrs. Wright and Price from Messrs. Allbut and Daniels, of Hanley.

## An Opinion of the Workmen's Exhibition at the Agricultural Hall, London.



EXHIBITION at the Agricultural Hall, London, has now been open a month, and its effect by this time should have become sufficiently apparent for the promoters to judge as to the success of the undertaking, and for the public to have come to their conclusion as to its practical value. To those who have studied the exhibition from a thoroughly disinterested position, it teaches a lesson which will not readily be forgotten, and that is, "What an exhibition it might have been, if all artisans had put but a tithe of their energy into contributing or assisting to contribute an exhibit." Although there are many trades represented, yet there is not one *in extenso*, and those which are absent seem to be legion. Why this has happened it is very difficult to tell, but it seems to have arisen from a want of individualism in its management, and from the curious set of questions or obstacles placed in the way of exhibitors. The latter were probably not so difficult as they appeared, but yet they were sufficiently formidable to prevent would-be exhibitors from even asking further questions. It is a great mistake to hem these things about with obstacles, against which the average artisan does not see his way to cope. The whole path should have been made as smooth as possible. Of course, the management replies, then we should have had a lot of inferior exhibits. But better have had too many, than so few. The committee could still have reserved its right to decline to exhibit. The other point is the want of individualism in the management. It is no use expecting that a successful exhibition can be run by a voluntary or honorary management committee: it leaves too much for everybody to do, and no one knows what he has to do. The surest way is to appoint a well-known good organiser, and pay him properly, so that he can engage assistants and go into the business with thoroughness for months prior to the opening. It is even possible that many trades did not know of the exhibition at all. The printing trade, outside London and Leicester, knew practically nothing of the affair. It is this absence of management which is to be deplored, for it has thrown away an opportunity which may not occur again for years.

So far as the exhibition goes the individual exhibits are mostly excellent, but the absence of comparison leaves the visitor entirely in the dark as to the relative qualities of different makes. Now that it is nearly over, the suggestions as to what it might have been are probably too numerous to mention. But it certainly could have been one of the most unique systems of educating the London public upon the quality of this country's goods that has ever been held. In the first place, the object of the exhibition was to show the superiority of British work, and how could that possibly be done without comparison with foreign work. In the brush business nothing could have been

easier than to exhibit side by side English and German brushes, and show how the foreign brush gives way in use as against the permanence of the English one. In the same way, nearly every article in the exhibition could have asserted its superiority by comparison. Not only the mere comparison of external appearances, but the conditions of labour could have been also made subject for comparison with continental workmanship. To each thoughtful observer there must have occurred a multitude of ideas as to how comparisons could have been made: comparisons in which the whole course of manufacture could have been reviewed, shewing the superiority of British work. As it is, visitors have simply one or two exhibits in each section to frame any opinion upon, and come away with a feeling that in all probability very much better work is produced in this kingdom than actually found its way to within the walls of the Workmen's Exhibition of British Industries.

### Visit of the Litho Artists' Society to Leicester.



THE seventh delegate meeting of the Amalgamated Society of Litho Artists and Engravers took place at Leicester on June 24th and 25th last. Thirteen delegates from as many centres, together with Mr. G. Johnson, president of the Society, and Mr. C. Harrap, general secretary, attended, and the whole of the proceedings were of a thoroughly businesslike and pleasant character.

Preparatory to the business meeting, the delegates (with commendable punctuality) marched in a body upon the litho department of the De Montfort Press, and for the time being, at least, the various rooms suffered from an inundation of artistic critics, all "in the know," and from whom the various occupants of the works doubtless received much valuable information, which may appear in due time in their work on the illustrative portion of the B.L. The calls of business tore them away at about 10 a.m. to the Granville Hotel, and with the exception of a slight break for lunch and undergoing the ordeal of being photographed, the many items of business occupied the attention of the legislators until about 5.30, when dinner, served in good style, was efficiently attended to, a few local members of the trade joining the delegates at their task with perfect unanimity. Dining wisely, and of course not too well, the after-part of speeches and gentle relaxation was of a very cordial, not to say convivial, nature.

The business was necessarily of a private nature and ran into the next day, but the programme closed with a pleasant drive into the country, doubtless expressly undertaken with the intention of clearing the minds of the wearied workers from the exhausting effects of the preceding press of business, and to leave them in a proper state to still further forward the interests of the powerful and intelligent organisation they so ably represent.

MR. S. THEODORE MANDER, of Messrs. Mander Brothers, Wolverhampton, has been appointed a magistrate for the county of Stafford.



Printed with Alexander Brothers' Lithographic Inks.  
On Smith & Mc Laurin's Celebrated Chromo Paper.

Works - Wolverhampton.  
Johnstone, Scotland.



*Colour No2. Flesh.*

Specimen of Chromo Lithography in 11 printings, drawn direct and printed at  
machine from plates Manufactured by the Patent Lithographic Zinc Plate Co. Ltd. Hull.



## An Australasian Lithographic School.

ALBERT LAWSON,

INSTRUCTOR IN LITHOGRAPHY AND PHOTO-LITHOGRAPHY, TECHNICAL COLLEGE, SYDNEY, N.S.W., AUSTRALIA.

THE subject of our sketch is a native of Sydney, New South Wales, being born in the year 1853. He received his education at Christ Church School, Sydney, being an old school-fellow with the newly-appointed instructor in typography. After being with a dentist for about two years, he commenced his career as a lithographer, and was bound, at the age of fifteen, with the firm of S. T. Leigh & Co. Lithographic printing at that time was in rather a primitive state in Sydney, being all done by hand-press. This continued during the greater portion of his apprenticeship of five years, but towards the end of that time a revolution took place in the trade, in the shape of what was generally termed the "Wolfe" making its appearance; this was nothing less than a double-deny machine by Conisbee. Most of the workmen now looked upon their occupation as gone, but not so with Mr. Lawson, who, on seeing the first impression of the machine, saw at once a great future before the lithographic trade, and immediately set to work to master the position, which after results proved he successfully accomplished.

Two years after this he became foreman of the office, and some time later he worked out (self-taught) the principle of the zinco process, and produced the first zinco process blocks in New South Wales. About this time he was taken ill with typhoid fever, and was away from business close upon twelve months. During the time of his convalescence, he worked out the principle of photography and photo-lithography, and afterwards carried these out with marked success, some of the first specimens of photo-lithography seen in Sydney being produced by him.

Three years ago the position of the instructor to the lithographic class at the Technical College,

Sydney, became vacant, and Mr. Lawson was appointed, and has brought the class to the highest state of perfection. Twelve months later on a class for photography was commenced, to which Mr. Lawson was also appointed instructor, the classes being held in the evening and on Saturday afternoon.

During this time, the firm with whom he was employed (Messrs. S. T. Leigh & Co.), were largely extending their business, Mr. Lawson being appointed as manager last year, which position he occupies with credit to himself and profit to his employers.

Mr. Lawson is a first-class workman, very quiet and unassuming, and looked up to with very great respect by all with whom he is brought into contact, and is generally considered as holding the first position in the lithographic business in Sydney.

Our Sydney correspondent says: "Mr. Lawson's classes are thoroughly appreciated by the students, there being an average of from thirty-five to forty each week, mostly journeymen, all of whom take a very great interest in the work."



MR. ALBERT LAWSON,  
*Instructor in Lithography.*

The following recipe is given to an enquirer in *Work*: "Black printer's (letterpress) ink consists of

Balsam of copaiba .. .. .	9 oz.
Lampblack .. .. .	3 "
Indigo .. .. .	1 1/2 "
Indian red .. .. .	1/2 "
Dry turpentine soap .. .. .	3 "

These are ground until smooth and fit for use." This recipe is given to shew that if all letterpress black is thus constituted, it cannot be much use for letterpress transfers to litho stone. If used, as it frequently is, it should be used quickly to catch what little grease there is in it. It is advisable to use proper retransfer ink or to add some to the letterpress ink for lithographic transfer work.



# The City and Guilds Examination in Lithography, 1893.

• • • QUESTIONS WORKED OUT. • • •



## ORDINARY GRADE.

QUESTION I.—What kind of ink would you employ to print upon ordinary blotting paper?

ANSWER: A thoroughly well incorporated lithographic ink, with as little varnish as possible, and kept soft to prevent tearing the paper by a little Mander's or

Trochard's pomade.

QUESTION II.—What pigments used for inks have lead for their basis?

ANSWER: The pigments prepared from lead compounds are:—

Yellow chrome	from the chromate of lead.
Orange chrome	.. red chromate of lead.
White lead	.. carbonate or sulphate of lead.
Flake white	.. carbonate and hydrate of lead.
Red lead	.. oxide of lead.
Naples yellow	.. oxide of lead with antimony oxide.
Turner's yellow	.. fused sub-chloride of lead.
Massicot	.. oxide of lead.

The last two are seldom used, but should not be omitted where a complete list is required.

QUESTION III.—Describe the difference between the methods employed for proofing drawings on zinc and on stone, including etching and rolling up?

ANSWER: The question is a very general one, and leaves a wide field for reply. It does not specify whether the stone is polished or grained, but as the difference is less between the treatment of zinc and grained stone than it is between zinc and polished stone, it will be as well to deal with the latter principally, and only touch in a casual way upon the grained stone. In comparisons of this kind it is advisable to tabulate the matter thus:—

### DRAWINGS ON ZINC.

(1) When received from the draughtsman are not gummed up unless he has etched them.

(2) Must be etched immediately after drawing, whether they are in ink or chalk, to convert any surplus soap, as well as the ink itself, into an insoluble compound with the zinc.

(3) After etching, the gum is allowed to dry upon the plate, and for rolling up may or may not be removed.

(4) The whole plate may be rolled solid black on the top of the dry gum after the work has been washed out with turpentine. Then sprinkle water on the black surface and roll till clear.

### DRAWINGS ON POLISHED STONE.

(1) When received from the draughtsman are usually gummed up.

(2) Need only be etched before gumming up when they contain large masses of thick ink, or have been executed in stipple, splash, or air-brush tints consisting of thick ink.

(3) After gumming up (or etching, if need be) the gum is allowed to dry, and is washed off before rolling up.

(4) The work should be carefully rubbed up, or rolled up, with a soft ink, and the remainder of the stone kept moist with gum and water.

### DRAWINGS ON ZINC.

(5) When rolled up, the work should be etched finally with phosphoric acid and gum.

(6) The first etching compound consists of nut-gall decoction, phosphoric acid, and gum; or phosphoric acid and gum only.

(7) Plate requires less damping owing to the amount of water held in the grain.

(8) To clean up zinc plates it is better to use a solution of caustic soda and a stump.

(9) Lay marks must be drawn with silver.

(10) The ink must not be thin.

(11) To wash out work on zinc a mixture of oil and turpentine should be used.

### DRAWINGS ON POLISHED STONE.

(5) When rolled up, it should be washed out and carefully rolled up in a stiffer ink than used to rub it up with, and finally etched lightly with very weak nitric acid and water.

(6) The first etching compound consists of nitric acid and gum.

(7) Polished stone requires frequent damping, but grained stone only requires the same as for zinc.

(8) To clean up stone, polishing stone, scraper, and acid stump may be used.

(9) Lay marks may be drawn with printers' lead.

(10) Ink may be thin or stiff, and rolling accordingly.

(11) To wash out work on polished stone, either turpentine or terebine may be used.

(12) Grained stones are rolled up in a more careful manner than polished stones, but on the same basis, and washing out should be avoided.

[The word "proofing" should only be applied to proofing of hats, or water-proofing of material for garments and such purposes. In printing, the substantive is the "proof," but the verb is "to prove," or test, or verify, and only admits of being spelt in the correct English manner. There have been attempts lately in large firms to introduce this supercilious word "proofing," and it seems a pity that it should have been set in an examination paper, giving weight to the usage of a word which is unnecessary whilst the true word exists.—Ed.]

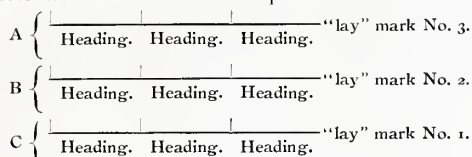
QUESTION IV.—What means would you employ to make black or similar ink hold upon previously printed bronze work?

ANSWER: If the bronze has already been printed in the usual way without any regard to what has to follow upon it, then the difficulty will be to get black or other ink to print with its usual brilliance. Under such circumstances a very thin varnish tint should be printed upon the bronze and allowed to dry thoroughly. Black or other pigment may then be printed successfully upon it. But if it be well understood before printing the bronze that black or other pigment has to follow on, then the bronzing ink should be printed as sparsely as possible, and the bronze dust should be put on just to cover and well dusted off. Such a course is generally adopted to get a good black printing upon bronze.

[The word "hold" in this question is capable of a double meaning, and might have been avoided in a test examination.]

**QUESTION V.**—Describe two methods of printing note headings at hand press (eight or more on stone) without leaving marks upon the paper?

**ANSWER:** To print note headings at the hand press quickly and in separate sheets, so as to avoid any mark or impression being left upon any of the sheets, they can be arranged to be printed to "lay" marks. The headings may be patched up in rows of three or four, each row being patched with as little room between as will allow of a good pressure on all, and sufficient space to allow the "lay" marks to be avoided by notches in the scraper. The following sketch will assist in this description:—



The stone having been prepared in this manner, and trial (or proof) sheets taken, it will be seen that the sheets "laid" to No. 1 will mark the sheets laid to No. 2 at the line No. 1, and the sheets "laid" to No. 3 will be marked at No. 1 and No. 2 by the sheets underlying. To avoid this, after fixing the stone firmly, mark upon the scraper where the lines 1 and 2 fall. Remove the scraper and, with the edge of a file, notch about  $\frac{1}{8}$ -in. deep and  $\frac{1}{8}$ -in. wider. On replacing the scraper, it will be found that the marks have disappeared when pulling the impressions of the nine headings; but the different thicknesses of paper will cause the headings marked C to be darker than those marked B, and those in turn darker than A. To overcome this, the tympan must be patched with two thicknesses of soft paper (thin blotting paper) to fall over the headings A and one thickness over B. Thus an evenness of pressure will be secured to all, and all marking of the sheets avoided.

The same result can be obtained in another way, by "packing" instead of "notching" the scraper. The transfers can be put upon the stone in the same manner, but the scraper must be furnished with a leather shoe, and the tympan should be zinc or brass. To avoid the lay marks, and to give an even impression to all the headings, slips of cards of three thicknesses are placed between the leather shoe and the scraper, the thinnest card to be over the headings C, a thicker one over those marked B, and the thickest over A. These slips are placed a little way apart to leave spaces to miss the "lay" marks, just as the notches would do in the previous method.

These methods seem to be far more intricate in description than they really are in practice, and where this system prevails a scraper of one or the other kind is always kept prepared for such orders.

**QUESTION VI.**—Given a transfer to put down on stone drawn upon paper, whose qualities you had no knowledge of, how would you proceed in forming an idea of how to treat it?

**ANSWER:** The composition on a transfer paper is either soluble in cold water or in warm. If, therefore, a piece of transfer paper of unknown composition be

placed in the hands of a printer, he can determine by wetting a very small corner whether the composition will dissolve and wash off, or whether it only becomes very sticky and does not readily wash off. If it wash off readily it is a common glue, or flour paste, or starch composition, and should be put down dry upon a wet stone. If it only becomes sticky and does not dissolve or wash off readily then it is a best glue, gelatine, parchment, or isinglass composition, and must be damped in the damp book, and put down on a warm, dry stone. The amount of damping in either case will depend upon the accuracy of the above tests, and upon the thickness of the composition upon the paper, determined by inspection.

**QUESTION VII.**—Of any twelve inks you are acquainted with make out a list, dividing them into "transparent," "semi-transparent," and "opaque."

**ANSWER:** The following twelve printing inks in common use may be classified under the three divisions, thus:—

TRANSPARENT.	SEMI-TRANSPARENT.	OPAQUE.
Madder lakes.	Orange-chrome.	Yellow-chrome.
Cobalt.	Raw sienna.	Naples yellow.
Burnt sienna.	Yellow ochre.	Vermilion.
Prussian blue.		Terre verte.
		Ultramarine.

The distinction as to "semi-transparent" is very hard to draw, and it is only by comparison that pigments can be relatively and not absolutely classified. Thus, orange-chrome is not as opaque as vermilion, and burnt sienna is more transparent than raw sienna or yellow ochre. But the semi-transparency of orange-chrome is far more perceptible than that of raw sienna or yellow ochre. A better method would be to arrange the pigments in one long list, commencing with the most transparent and terminating with the most opaque.

**QUESTION VIII.**—What are the characteristics of "wove" and "laid" papers, and how is each produced?

**ANSWER:** The names "wove" and "laid" as applied to paper, had originally a very distinct meaning, which recent paper-making appliances have entirely removed. The only real distinction left between papers is whether they are "hand" or "machine-made." This difference carries with it qualities which render the one distinct from the other in a small degree only.

The original application of the word "laid" meant that a paper was handmade, because the frame upon which each sheet of paper was made consisted of a large number of fine wires, "laid" parallel to each other, and strengthened at intervals by other wires laid in the opposite direction. During the process of "shaking" the paper, the pulp became so permanently marked with the wires as to retain the "laid" line appearance in the finished article. But in making paper by machinery, a dandy roll can be brought to bear upon the pulp and impress it with "laid" lines exactly similar to handmade papers. All the ordinary foolscap paper is of this character, and writings up to 70-lb. imperial are produced quite equal to handmade papers for many of the same purposes.

The word "wove" always carries with it the fact that the paper is machine-made, because the web (or frame) upon which the paper is made is of a closely netted or woven texture, and marks the paper with its mesh, at the time when the water is being forcibly drawn from the pulp by the exhaust boxes under the web.

**QUESTION IX.**—Give a formula (recipe) for a transfer paper specially suitable for taking impressions of chalk drawings on grained stones, and state why you prefer it.

**ANSWER:** The grain of the stone being somewhat deep and more difficult to reach, is not amenable to the same treatment as the flat stone. To take a good impression from grained stone, it is necessary to use a fairly thick, well-made plain printing paper, and to take a transfer from such stone the composition on the paper must have a good body, and be sufficiently soft to allow it to be forced down into the grain to pick up every particle of work there. Such a composition should contain a little gelatine to bind it together, and for the most part should be composed of flour paste and plaster of Paris prepared as for Scotch transfer paper.

The formula for the composition may be :—

Seconds flour	...	...	...	...	1-lb.
Plaster of Paris	...	...	...	...	1-lb.
Parchment clippings or best glue	...	...	...	...	1-oz.

When prepared in the same way as Scotch paper, it must be coated upon a paper equal in weight to a 20-lb. or 25-lb. demy, and well rolled when dry.

**QUESTION X.**—What are the chief adulterants of vermilion ink, and how would you detect them?

**ANSWER:** Pure vermilion contains a large percentage of mercury, the market value of which is comparatively high and causes pure vermilion ink to be expensive. Manufacturers therefore resort to the malpractice of adulterating it, to sell it cheaply and pass it off as "vermilion." Sometimes it is adulterated with fugitive scarlet lake, which gives it a bright appearance for a few days after printing: it then fades out and leaves a dirty dull red in its place. Sometimes the "vermilion" is not vermilion at all, but simply a mixture of red lead and scarlet lake. The printer has ready means at his disposal to detect any form of adulteration: pure vermilion submitted to heat—as when placed in a crucible over a gas jet, or on a palette knife in a gas flame—volatilises, or rather sub-lines, which is a dry distillation. The vermilion having gone, leaves any adulteration in the bottom of the crucible or on the knife. When vermilion is sold ready prepared in tins, as a printing ink, to test its purity it may be rubbed out on paper, and if any yellow stain appears it is caused by adulteration; or, if nitric or hydrochloric acid be added to vermilion, the pure vermilion remains unchanged, whilst the substances used to adulterate it are frequently changed to a yellow compound.

**QUESTION XI.**—Describe how you would test a stone to ascertain whether its surface is truly ground.

**ANSWER:** To test the "truth" of the surface of stone when ground, it must be taken for granted that an accurate straight-edge is available. With such a straight-edge two tests can be applied, the first being the more accurate. Place the straight-edge across any part of the stone, place the eye on a level with the stone's surface, and on the opposite side of the straight-edge, also on a level with the stone, pass a light (match, taper, candle, or gas jet) along. If there be the slightest hollow in the stone, the eye will perceive the light at that part. Secondly, if the straight-edge be placed upon the stone, a rough means of testing the "truth" of its surface is to place a piece of fine writing paper on the stone and try all along the straight-edge to pass the paper under it. In this way any hollow deeper than the thickness of the paper will be discovered, whilst by the previous test any hollow less than the thickness of the paper will become apparent.

**QUESTION XII.**—Why do such substances as litharge cause printing inks to dry much more quickly?

**ANSWER:** Litharge is one of a series of substances known in painting and printing as driers. The drying of oil colours depends upon the oxidation of the oil with which the pigments are mixed. Drying oils will eventually dry by themselves, by oxidation; and such oils when "boiled" or "burnt" will dry even more rapidly. But by the addition of such substances as litharge, the affinity for, or the power of uniting with oxygen is increased, and if such added substances possess an excess of oxygen, this is readily absorbed and the drying is brought about more quickly. Bodies of the same class as litharge also seem to act as carriers of oxygen. They first lose it, then regain it from the atmosphere, to lose it and regain it over and over again.



#### HONOURS GRADE.

**QUESTION I.**—Describe a method for keeping transfer tracing paper nicely smooth and even when drawing upon it.

**ANSWER:** In the use of transfer tracing paper, it depends very much upon the nature of the copy as to the best means for securing the tracing transfer paper to give it a smooth working surface. When the object to be traced is an earthenware tile, plate, or cup, a metal surface, or glass, the best means is to fasten the paper on the surface, or bend it round the edges and fasten it to the back with engravers' wax or paste. Engravers' wax may also be used to secure it to the surface of a paper copy, and when completed can be removed without leaving a very perceptible stain. If it be possible to first paste the copy to a drawing board, then the transfer tracing paper may be fastened over it with drawing pins; or it may be damped on the back and stretched over the copy and fastened with paste or glue; or it may be sufficiently large to be caught by a frame encircling the board and drawn down tightly over the copy.



Printed with Messrs Mander Bros Lithographic Inks.  
Works, Wolverhampton, England.



GRAY & LAWRENCE LITHOGRAPHERS 11, FLEET STREET LONDON

*Head of "Ciociaro" Donkey Boy.*



**QUESTION II.**—Suppose a piece of stone were submitted for your opinion as to its suitability for lithographic printing and drawing, how would you test it?

**ANSWER:** To test any stone as to its capabilities for printing purposes in the simplest and surest way, is to put it into practical use. Have it ground and polished, and if the surface polishes smooth and clear enough for drawing upon, give it a trial by drawing on it. If the drawing "runs" it is too porous. Then gum it up, have it rolled up, and etched. In rolling it up it will be seen if the grease repels the water; a necessity in lithographic printing. If it then shews no signs of a pitted surface, and the work stands in relief after etching, the stone may be considered suitable. Such a test is more economical than any other chemical tests or examinations. The only other feature to be proved is its hardness, which can only be proved by running it in a machine, or submitting it to heavy pressure in the hand press, and by allowing a piece of the stone of known weight to lie in water for a week, after which if it be found not to have lost weight, it is good enough for the purpose.

**QUESTION III.**—Describe the advantages of electric lighting as applied to a lithographic workshop, and the difference between "arc" and "incandescence" lamps, and their respective merits in relation to colour printing.

**ANSWER:** The question of electric lighting in printing establishments is one which cannot very well be discussed as a whole, nor is it one upon which practical experience is entirely in its favour. In the question, the lighting of a lithographic workshop alone is under discussion, to the exclusion of the letterpress department, and in this direction perhaps it is all in favour. But the character of the light is an element which must be dealt with. In the artists' department it is next to impossible to work with the arc-light, whilst in the printing department the arc-light is essential. The only way to accommodate both is to fit up the artists' department with incandescent lamps upon brackets or weighted chain pendants, and to have a number of large arc-lights in the printing rooms, with incandescent lamps under the feedboards. The arc-light is formed by the passage of the electric current between the external carbon poles of a battery or dynamo, and results in the gradual combustion of such carbon candles. The light so produced is an intense white light, so pure that experimentalists in spectrum analysis use it as the only source of unvarying white light. The incandescent light, on the contrary, is the result of passing a powerful electric current through thin platinum wire enclosed in a vacuum. The wire becomes red, or yellow, or white hot from the heat generated by the resistance of the wire to the passage of the current.

The advantages of electric lighting are:—

1. The absence of the noxious coal gas, with its pipes, joints, and repairs.
2. The absence of the intense heat in the printing room; the heat which causes the air to take up so

much moisture, and at night to deposit the moisture in the paper and make it go out of register; the heat and moisture which make life so oppressive.

3. The absence of the formation of carbon dioxide by the combustion of the coal gas, which, with the moisture and waste animal matters from the lungs of those working in the rooms, vitiates the air and is the great cause of consumption in populous centres of industry.

4. The absence of a wavering light, and its replacement by a steady reliable one.

5. The absence of the misleading yellow light, and the introduction of a standard white light, where the arc-lamp is used.

On the other hand, it should not be overlooked that man is an ordinary animal upon the face of the earth, and although candles, oil lamps, and gas lamps have in succession lighted up the natural darkness and have gradually trained the human system to work in artificial light, yet the organs of sight are not yet strong enough to work in this constant unnatural glare. The result so far has been a lot of relative blindness, which in a few generations may be entirely overcome.

As to the respective merits of the arc-light and incandescent lamp for chromo lithography, the whole advantage lies in the use of the white arc-light. Under such a light, the purity of colour is even greater than in ordinary daylight. But the incandescent lamp emits a light which, though not so yellow as gaslight, is still quite yellow enough to mislead anyone in the passing of colours.

**QUESTION IV.**—In printing in colours, it sometimes happens that after a few colours have been printed, the following colour gradually recedes from its place on the design; why is this and how can it be prevented?

**ANSWER:** In chromo lithography the skill of the printer is sorely taxed by the quality of the paper, the chemical character of the pigments, and the nature of the medium in which the pigments are ground to form inks. The paper, though enamelled, is frequently too thin to be able to absorb all the colouring matter and varnish put upon it. The result is that after two or three colours have been printed the paper is saturated and the remaining colours have to lie one upon the other. If the varnish used be at all stiff, then these printings dry like glass, one upon the other; there is no absorption taking place. When, therefore, a greasy colour comes upon this surface, containing a pigment which is a good drier, or into which a quantity of driers has been introduced, it at once commences to mottle and dry in patches. To overcome this difficulty, it is necessary in starting the printing to use soft inks: inks not overburdened with stiff varnish, having a small quantity of raw oil in them—or better, inks having a little Manders' or Trochard's pomade in them. This retains in them a certain softness which seems to assist each successive colour—especially if it be also tempered with a little "pomade"—to dry into the last instead of upon its surface. If the mottling should shew itself during



printing, it can be prevented in further copies by sprinkling glissol on the inking slab. And if all other means fail in getting the last two or three printings on without mottling, to save the whole order it is more economical to put an extra printing consisting of a flat, solid tint composed of varnish and raw oil, or varnish and pomade. This will revive the absorptive power of the print and the last colours can be put on successfully.

**QUESTION V.**—Suppose an architectural drawing is marked as being drawn to a scale of one inch to the foot, how must it be marked after it is reduced to one-half the area?

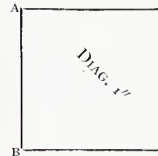
**ANSWER:** This question of scale is very difficult to solve, and involves the use of a very clear knowledge of proportional areas. In ordinary practice, such a problem would scarcely, if ever, crop up. In business a customer might bring a drawing and say distinctly the size he wished it to be reduced or enlarged to, in order that it might fit into a book or other known size of pamphlet or leaflet. When it was reduced, it would be easy by a few comparative measurements to determine the absolute scale of the new copy. But, asking a printer to reduce it to one-half its *area*, and to work out arithmetically or geometrically the scale of the new copy is altogether beyond common requirements. Therefore, that which

of which it is the diagonal. Putting this into figures, the diagonal being one inch, the square of one inch is one square inch, and the half of one square inch equals one-half square inch. Since the area of this square is one-half square inch, any two sides multiplied together will give one-half. To find the length of one of such sides it must be represented by one-half of the square root of 2, represented thus:—

$\frac{1}{2}\sqrt{2}$  which equals approximately  $\cdot 7071068$ , and this decimal fraction =  $\frac{7}{10} + \frac{71068}{10000000}$ , the latter being scarcely worth attention, for by squaring  $\frac{7}{10}$  is obtained  $\frac{49}{100}$ , or only  $\frac{1}{100}$ -square inch short of the one-half square inch.

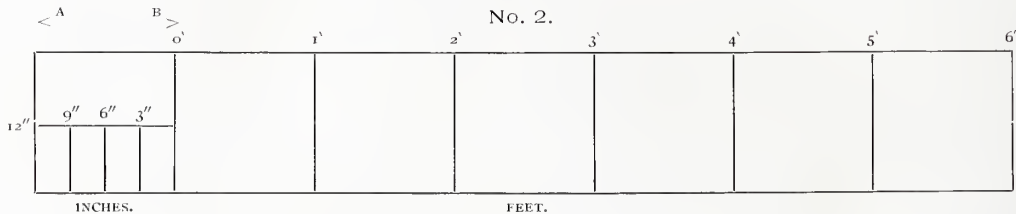
The answer, as near as a seven-figure fraction will give, is a scale of  $\frac{7071068}{10000000}$ -inch to a foot, or nearly  $\frac{7}{10}$ -inch to a foot.

No. 1.



No. 1 is a square with diagonal one inch. The side AB is taken as the unit (to represent one foot) of the scale, No. 2.

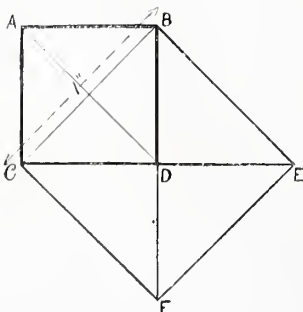
The question, however, can be solved by constructing a scale which can be put upon the reduced copy. Thus:—Construct a square upon a diagonal one inch long, and use one side of the square as the scale for one foot. Make the scale for ten feet or more, and divide one foot into twelve to denote inches, as shown by the figures annexed.



Scale for reducing to half-area any drawing constructed on scale of one inch to a foot.

would never be expected from the most prominent printing firm of the day, should not be expected from the foreman lithographic printer or any in his employ.

The question must be solved by reference to a small plain figure of known dimensions. Take, therefore, a square, ACDB, having a diagonal, BC, one inch long; upon its diagonal construct a square, BEFC, having the diagonal as a base. It can be shown by geometrical proof that



all of the triangles, BDC, BDE, EDF, and FDC are equal, and that the square, BEFC, is equal to four triangles of the same dimensions as the triangle BDC, or that such a square is twice as large as the original square ACDB. Since the square of the diagonal is twice the area of the square

of which it is the diagonal, therefore, one-half of the square of the diagonal is equal to the area of the square

**QUESTION VI.**—Describe the difference between a modern English handpress and the older German or French ones.

**ANSWER:** This question is very indefinite, and the answer may be considered correct or incorrect just as the examiner wishes to denominate it. Modern English presses of the different makers vary in detail, but have the one principle. Again, as to what is intended by "the older German and French ones" is not clear. Lithography is nearly 100 years old, and the presses have varied in each score of years. The "modern" press will date back some thirty to forty years, but as to what the older German and French press is, is difficult to say. If it is intended to infer the "original" handpresses of 1800 to 1830, then something can be said as to "the difference."

In the modern handpress the carriage is driven under the stationary scraper by a revolving cylinder, and the pressure is put on by raising this cylinder to the carriage, whilst the amount of pressure is regulated by a screw working rigidly in a cross-head, and not liable to fluctuate.

In one of the original presses the stone was stationary, and the pressure was brought to bear, and regulated in force, by a system of levers worked

by the foot of the printer on a treadle, the scraper itself being forced over the tympan by the hand.

In another press, not later than 1820, the stone was made to travel under the scraper by being pulled by a strap over a fly wheel at one end of the machine, the wheel being worked by handles similar to copperplate presses. But in this press the scraper was movable, and was brought down by the tympan by a hinge at one end, and looped at the other to a slide in uprights at the other end. This slide was actuated to give force of pressure by a series of levers worked by a treadle.

Another difference is the almost entire absence in modern presses of a second frame or frisket fitting under the tympan and hinged to one end.

[Descriptions such as these are not nearly so good as illustrations, and in a subsequent number of this journal the matter will again be dealt with.—ED.]

QUESTION VII.—What additions are made to dry pigments to enable them to be used as dusting colours and not to soil the paper?

ANSWER: Dust colours, or dusts when ground in their natural state to a fine powder, or when prepared by manufacture and then ground to a fine powder, are very liable to lodge in or upon anything, and cannot be easily “dusted off.” Water-colour pigments, when made into a wash, shew this tendency strongly, although in the dry cake they are compact and do not stain. If water-colour pigments, therefore, be again ground down to fine powder, they may be used for dusting. In a similar way any pigment prepared by mixing with it a proportion of any mucilaginous substance, then dried and ground, is capable of being used as a “dust.” The mucilaginous bodies may be gum and water, sugar and water, thin parchment gelatine, glue or isinglass sizings.

QUESTION VIII.—An estimate having been given to print a job on a demy sheet, the customer wants it on royal of the same quality, how much per cent. extra on the item of paper should be charged for it?

ANSWER: The difference in the size of the sheet of paper makes a proportionate difference in the weight of the ream, and a corresponding increase in the cost of the paper. The original estimate having been given for a demy sheet,  $22\frac{1}{2}'' \times 17\frac{1}{2}''$ , and the order having to be printed on royal sheets,  $25'' \times 20''$ , will increase the cost by the fractional difference in the sizes of the sheets. This difference can be determined thus:—

$$\frac{22\frac{1}{2}'' \times 17\frac{1}{2}''}{25'' \times 20''} = \frac{393\frac{3}{4}}{500} \text{ square inches.}$$

The difference between the two sheets equals  $106\frac{1}{4}$  square inches, and the fractional increase of area per sheet equals  $\frac{106\frac{1}{4}}{393\frac{3}{4}} = \frac{1}{3}$ , or more than  $\frac{1}{4}$ .

$\frac{1}{3}$  equals nearly 27 per cent. increase of cost.

The above fraction,  $\frac{1}{3}$ , can be derived by less multiplying, thus:—

$$\frac{22\frac{1}{2} \times 17\frac{1}{2}}{25 \times 20} = \frac{63}{80}, \text{ or } \frac{80}{63} = 1\frac{17}{63},$$

shewing the royal sheet to be  $1\frac{17}{63}$  larger than the demy sheet.

QUESTION IX.—Gelatine not acted upon by light and the chrome salts, in the case of collographic printing, resists the application of printing ink, why then is it not suitable as a substitute for gum in lithographic printing?

ANSWER: Gelatine, as used for the collotype film, must be kept moist during printing. If it gets dry, and is left exposed to air and light, it gradually hardens and becomes insoluble. Similarly, if used to substitute gum it would be liable to set in a jelly, or harden by oxidation, and then be in a condition to take ink the same as grease. The price of gelatine is another reason why it would not suit.

QUESTION X.—What means are employed to keep textile fabrics, such as silk, &c., in position when printed upon in more than one colour?

ANSWER: Printing upon fabrics in colours has usually to be done by mounting them firmly at the commencement upon card or thick paper, and keeping on until finished.

QUESTION XI.—Describe briefly the distinguishing characteristics of “line,” “mezzotint,” and “aquatint” engravings?

ANSWER: “Line” engravings are characterised by the whole picture being worked up in straight or wavy lines of varying thickness. Foliage can be discerned as a number of short lines, and rotundity is frequently obtained by stippling the ends of fine lines.

“Mezzotint” engraving has a foundation of a solid mealy tint, not unlike the tinting upon grained stone work, and throughout the picture this meanness is discernible. Generally the picture is worked up wholly from this grounding, very few final touches being made with a graver.

“Aquatint” engraving can be distinguished by the fine reticulations in the tints, not unlike work upon fine grained paper having a mechanical grain. But the aquatint grounding is clearly cut away very sharp and clean where necessary, and the engraving can be finished either as an etching, or, as was more generally the case, by the graver.

QUESTION XII.—Describe a method of “intaglio” photo-engraving upon copper.

ANSWER: Intaglio photo-engraving is a somewhat long process, and is divided into the

- (a) Preparation of the negative and transparency from it.
- (b) Preparation of the plate.
- (c) Preparation of carbon resist.
- (d) Printing the picture.
- (e) Printing from the plate.

The transparency is prepared upon special transparency carbon tissue, and in the act of soaking it a gelatinised glass plate is placed under it, and forms a support for its further development and retouching. From this transparency a further print is taken upon ordinary carbon tissue, which latter is placed upon the prepared copper plate and developed thereon. The copper plate has first to be scrupulously clean

and highly polished. It is then placed inside a closed box, in which resin dust has been revolved. The lighter particles of dust are allowed to settle in a fine film on the plate, which is carefully withdrawn and placed on a heater to just melt the resin and form, as it were, an aquatint grounding. Upon this grounding the second carbon print is made to adhere when moistened and placed under heavy pressure. The unaffected carbon tissue is washed away and leaves the picture bare upon the plate, to be etched in very lightly with a solution of perchloride of iron in methylated spirit, and about twice as much water added. The copper is discoloured by the perchloride and the action can be noted. The carbon film is finally washed off with soda, and when the plate is cleaned it is ready to print from. In thus working this process, masks of paper have to be used in each photo-printing to keep a wide margin around the picture. This same clean margin is preserved on the plate by a black varnish, which should also be painted on the back of the plate to preserve it from the acid in the etching.

[Such a description as the foregoing is merely an epitome of the process, and forms no basis for actual practice. The details are so intricate that in a subsequent number of this journal the matter will be fully described.—ED.]



PROCESS workers in this country do not seem to take kindly to transfer methods of putting the work down on the zinc, though on the Continent transfer work has been brought to the highest perfection, both for line and half-tone. The cause of this backwardness, we regret to think, is our national characteristic of want of patience, and reluctance to adopt any process which requires care and nicety of working. We (speaking of process workers in general) like to coat a piece of zinc, slap it down on a negative, print in a few minutes, and etch right away. But with the transfer method, there is the previous coating, sensitizing and drying of the paper, which will not keep more than three days for line work, and one day for half-tone. There is the careful rolling up of the transfer, the dusting, warming, damping, and transferring in the copperplate press, before a start can be made in the etching. The advantages are: quick printing; screw pressure frames dispensed with; ease of stopping out whites; possibility of transferring a number of subjects to one plate; a deeper etching before rolling up; and lastly, better work (if the process is well carried out).—*Process Work.*

TO FLATTEN out all creases from a print—or a printed copy—either for subsequent mounting or use as a copy for printing purposes, soak it in cold water until well damped through; then place it face downwards upon a sheet of glass, and squeegee it to the glass. This may be done with the photographer's squeegee, or an agate or other burnisher. Of course, a certain amount of discretion has to be used as well as the tools and process here given. When dry, it can be removed from the glass free from all creases.

## Manchester Municipal Technical School.

EMPLOYERS' PRIZES FOR APPRENTICES.

RESULT OF EXAMINATION ON APRIL 29, 1893.

THERE were twelve questions set, and each candidate was required to answer eight in three hours. Five apprentices presented themselves and secured the following marks:—

Candidate.	No. of questions worked.	Full marks given.	Marks obtained.	Percentage.
E. A. Coups ..	12*	145	102	70'34
J. R. Wildman	8	125	86	68'8
F. Stott .....	8	140	76	54'28
W. B. Woolley	7	125	57	45'6
R. C. Law ....	8	130	50	38'4

\* Eight questions only counted.

The prizes offered to the apprentices of both the letterpress and lithographic classes amount to £10 in value, and the successful candidates may choose books, photographic apparatus, musical or other instruments. The inducement is great, and is worthy of emulation by other large printing centres. The following are the questions set at this examination:—

1. Describe the various qualities of the surfaces of papers in use for printing. (20)
2. How can some of the difficulties of printing upon bad paper be overcome? (15)
3. Give in detail the qualities which bronzing ink should possess. (10)
4. Give the various ways of tempering bronze inks for different kinds of paper. (25)
5. State in inches the sizes of the following printing papers:—Foolscap, crown, demy, medium, royal, super-royal, imperial. (10)
6. If the weight of a ream of royal paper be 25-lbs., what will be the weight of a ream of imperial of the same quality? (15)
7. State the principles upon which a photo-litho transfer paper is prepared, and give its mode of use. (25)
8. Why does litho stone crack? (10)
9. What are the differences in treating a grained stone with chalk work on it, from a polished stone with work on? (25)
10. What is the chemical composition of vermilion, madder, ivory-black, Prussian-blue, chrome-yellow, and umber? (20)
11. Give a list of the best driers. (10)
12. State the details of preparing a keystone and off-sets for a thirteen-colour chromo litho, and give the order for printing the colours. (25)

ESSENCE OF CINNAMON has been discovered to be a powerful antiseptic. So much so, that germs of life—animal or vegetable—cannot exist more than a few hours at the most in its presence. This being so, a decoction of cinnamon is not only a good antiseptic drink where typhoid and cholera exist, but it can be used in lithographic establishments to replace carbolic acid in the gum, paste and damp book, and thus get rid of the use of that dangerous poison.





PLATE V.—DRYPOINT.



# Etching, Drypoint, Mezzotint.

BY HUGH PATON,

*Associate of the Royal Society of Painter-Etchers.*

## DRYPOINT.



DRYPOINT is the art of engraving direct upon the metal with the needle point. To this extent it is the same as the art of line engraving, but the line made is purely a scratch, and, therefore, altogether different in character from the deliberately cut line of the burin. It is similar to the furrow of a ploughed field; the needle cuts more or less into the surface of the copper, but in addition to that it throws up a rough edge, technically called the "burr."

This can be removed or preserved at will. As a matter of fact it is generally removed in all fine distance and shading, but largely preserved in foreground and middle distance; in short, in all the vigorous work on the plate. The depth of the line and the strength of the burr depend not merely upon the pressure used, but also, and if anything more so as to the burr, upon the angle at which the needle is held in relation to the surface of the copper. The line made with the needle held upright is shallow, and can hardly be said to have any burr at all, though, in fact, it has a little on both sides, due to the displacement of the copper in the line. This prints slightly, and may better be removed in the finest work such as that of the sky. On the other hand, with the needle held at a slope, the line made is much deeper, and the burr thrown up, this time on one side only, is decidedly heavy. Under this the ink lies exactly like the drifted snow in a country lane. It piles itself up under the lee of the wall, so to speak, filling the dry ditch just below it, and thinning off on the level of the road. This line prints with a peculiarly rich quality, which is altogether different from that of the comparatively clean-cut etched line. It can best be described by the word "velvety." It is not so clear as the etched line, but it is softer, richer, more seductive. It approaches more nearly to the mystery of nature in its comparative indefiniteness. It appeals less to the trained side of the artistic temperament, schooled into self control by severe labour, but rather to the passionate side, to the artistic temperament in its holiday mood. For some classes of subject it may be better adapted to the end in view than the etched line. This, however, is a matter of taste, and the choice between the two may be decided by the temperament of the artist, or even by the passing mood. All etchers are bitten by the drypoint fever at some time or other.

### EVOLUTION OF DRYPOINT.

Whether the practice of drypoint generally follows upon that of etching because of its tendency to grow, accidentally so to speak, out of the latter, does not come within my province to determine. The use of drypoint for the finishing of an etched plate is

naturally suggested to the etcher by the slight scratches found upon it in certain circumstances, as, for example, where a line has been drawn but not bitten in, having been stopped out before the acid is applied. (There are two such lines in plate II., first state: one under the vessel's bows, and the other just above the yard of the mainsail, both being removed in the finished state.) From that it is a short step to the execution of the whole plate in drypoint; the evolution is natural, perhaps inevitable. I cannot, however, help quoting a suggestive passage from Mr. Haden's address to the Painter-Etchers' Society in 1890, in which year it had made a special collection of the works of Rembrandt. Speaking of the etched and the drypoint lines, Mr. Haden says: "One of these lines again, the first or the bitten one, lends itself to sharp definition; the other, the drypoint line, to what an artist would call 'colour.' Now, when we hung up in the Burlington Fine Arts Club the whole engraved work of Rembrandt, as we did in the year 1877, we made a singular discovery, and that was, that for the first ten years out of the thirty which composed his practice of etching he used exclusively the bitten process; for the second ten years the bitten and the drypoint process combined; and for the last ten years, having acquired apparently sufficient command of the instrument for the purpose, the drypoint process alone. A further acquaintance, even with the portion of Rembrandt's work which hangs here, will enable you to trace it in these differences of practice." This passage has always appeared to me to be very suggestive of a mental evolution in the artist, bearing in mind the nature of the two lines, that may be altogether distinct from the mere natural growth of the one process out of the other, for in his earlier days the artist, whatever his temperament, is restrained by the severity of his training. He is preoccupied with the necessity of obtaining the mastery in technique; he is learning to express himself. But a little later, when he has obtained the necessary facility in the means of expression, the mind is free to follow its own bent, and certain temperaments will inevitably react somewhat from the rigidity of the schools while retaining the skill acquired therein. In such a case it is natural that, after the uncompromising clearness and decision of the etched line, the drypoint will exercise a fascination difficult to resist. It may have been so with the great master. This, however, is merely a suggestion in passing, which may be left to the consideration of those more able to form a competent opinion. However all this may be, the quality of drypoint is very fascinating, and the etcher will find great delight in it. Its practice will serve, if nothing else, to cultivate and keep alive in his work that indefinite quality called "feeling," so easy to speak of but so difficult to define. "Science is definite, but what is art?" Ay, there's the rub! "The things men spy with half-shut eye" may be felt, and seen, perhaps, but not described. It is the measure of success achieved in retaining this indefinite quality that makes the poet or the artist. As one of our most eminent actors said lately: "Art is good and successful just in proportion as it gives play for the imagination to clothe and supplement the conception suggested."



## THE PROOF.

While drypoint is a line process in common with etching, it has one great advantage over the latter in that a proof may be taken at any stage to show progress. The etcher is always working in the dark more or less (Mr. Hamerton says justly that etching is always a chemical experiment), but a drypoint plate can be proved at any moment, and this is not merely an advantage but often a necessity. The burr is so treacherous, often not so great as expected, or *vice versa*, that it cannot be reckoned upon with the same certainty as the etched line, and one or two proofs during the progress of the plate are practically necessary. It is always advisable, however, to avoid proving oftener than is really required, because the burr wears rapidly under the process of cleaning off the plate for printing, and under the pressure of the press, perhaps the former as much as the latter, and it is desirable to conserve it as much as possible. When the plate is completed it may be steel faced, but this only affords partial protection, especially to the strong burr of the foreground, and a drypoint plate can never be reckoned upon for so large an edition as an etched one can.

It must, of course, be kept in mind that the drypoint line is not so free as the etched one, the needle having to overcome the resistance of the copper. This, however, is not so great a difficulty in actual practice as might be supposed. With the point in good order, a steady hand will accomplish all that is desired after a very little practice, the resistance of the metal even lending itself to steadiness of drawing.

## METHOD OF WORKING.

When working from nature, say at a landscape subject, the needle should be used much as the pencil would be upon paper, pressure being applied according to the strength required, and slope according to the weight of burr. The artist, too, is able to work upon any part of the plate without regard to the necessity of obtaining his relative values by stages, by which he is very much restricted in etching; indeed, in this respect there is the most perfect liberty. For portraiture, and the same would apply more or less to any kind of subject, Mr. Menpes recommends that all the broad masses of dark should be laid in at first in open and not too heavy lines, and the slighter markings indicated broadly but lightly. After that the plate should be proved, and the further work added with the proof before you. The amount of work that can be added at each stage, and the number of proofs required before the plate is completed, is a matter of experience, though it may also depend partly upon the nature of the subject. The best advice that can be given is to carry the work as far as possible at every stage, and take as few proofs as possible.

## PREPARATION OF THE PLATE.

The drypoint line does not show well on the bare copper, as the metal reflects light in a very confusing way; and it will be found useful, in fact necessary, to ground and smoke the plate as for etching. The needle cuts the surface of the plate quite as freely through the ground as if there were none, and the first work on the plate can be carried to a fairly

advanced stage by this means before a proof is taken. The work of the needle shows, of course, as in etching, with perfect distinctness against the black ground. Afterwards, when the ground has been removed and the first proof taken, a mixture of lampblack and tallow, or anything else suitable, can be rubbed in with the finger as the work progresses. A tube of ordinary black or dark-brown oil paint from the colour box I have found as handy as anything. A very small quantity is sufficient, and can be placed ready to hand on a corner of the plate and rubbed in at any moment. The surface should be polished by the ball part of the thumb, so as to leave the paint in the lines, as in cleaning off the plate for printing. By this method the work is distinctly seen, and its strength can be judged of approximately, the black paint showing distinctly in the lines. To this extent drypoint is a positive process, showing black upon copper colour, and the artist can judge much more nearly the real state of his plate than he ever could in etching. In this respect, and in the freedom with which the whole plate can be brought forward at once, drypoint is in marked contrast with the wet process.

## THE POINT.

For the lighter work the ordinary etching point may be used, but it must be of the solid kind, made pretty sharp and quite round. The ordinary stout sewing needle, set in a wooden handle, sometimes used in etching, is of no use; the tool must be solid. For the stronger work, and especially when a heavy burr is required, a stronger point is necessary. It may be made by sharpening the end of an ordinary solid etching needle in two flat sections, somewhat like a miniature chisel. With this a very strong burr may be obtained. Indeed, all except the lightest work on the plate can be done by this point with much less labour than by the ordinary round needle. The tool, however, must be used somewhat carefully. Naturally it will only cut in the direction of its own edge, and it has a trick of going off at a tangent with a jerk if carelessly handled. But rightly used, it is a powerful tool, and in competent hands is capable of very beautiful and powerful results.

## COMBINATION WITH ETCHING.

I have pointed out how the drypoint line can be used with excellent effect for the distance and sky of an etched plate; indeed, the faintest drypoint line is much more delicate than the finest bitten one. Light shading also may be thrown over strongly bitten work with great ease and advantage by means of drypoint. But it is necessary to bear in mind that the drypoint line harmonises with the etched line in the lighter work only, and then only when the burr is removed. Some etchers use the strong drypoint line with the burr retained to add work in the foreground of an etched plate, but the result is not harmonious. The soft broad shallow line of strong drypoint is not at all in keeping with the strongly bitten line in the proof. Even the strong drypoint with the burr removed does not harmonise with the etched line, it is too shallow. It may, therefore, be laid down as a general rule that only light drypoint work with little or no burr should be used on an etched plate.

## REMOVAL OF THE BURR.

I repeat here a remark made in the paragraph on the use of the scraper and burnisher: the burnisher should never be used to remove the burr of drypoint, as it crushes the particles of copper into the lines, and so destroys their purity. Keep the scraper bright and keen, and you can remove the burr with it to any extent desired.

The erasure of drypoint is comparatively easy. The line is shallow, and the labour of altogether removing it not nearly so great as in etching. On the other hand, burr that is wearing out can be renewed to some extent, but it may depend on the nature of the subject whether this can be done with advantage or not. It is comparatively easy on a plate that has plenty of colour, but where the work is composed of few lines this naturally presents more difficulty, as purity is apt to be lost. It is better not to reckon upon a large number of proofs. In the illustration, for example, a few strong lines could be added anywhere in the deep shadow without any harm being done. There the nature of the subject allows it, but in a subject of slight and delicate treatment, such as that of the human figure, great care would need to be exercised not to overdo it and so spoil the plate.

For illustration I have selected a subject that affords an opportunity of showing, to some extent at least, both the delicacy and the strength of drypoint. The boat under the rafters of the shed contrasted with the strong shadow underneath will enable the reader to judge of these in some degree. I may be allowed to remark, however, that in the reproduction much of the former quality is lost, and in the shadow some of the richness too. But this was inevitable, and the reader will be good enough to allow accordingly.

[To be continued.]

PHOTO PRINTING.—The so-called “simplissimus” process of printing, due to M. Einsle, consists of taking a sheet of paper—whether ordinary printing paper, drawing paper, or writing paper—pinning it down on a drawing board, and applying an even layer of the following by means of a sponge:—

Common salt	...	...	...	...	2 parts.
Arrowroot	...	...	...	...	3 „
Water	...	...	...	...	100 „

We need scarcely say that the arrowroot must be softened or converted into paste in the usual way. When the paper is dry it is once more pinned on the drawing board, and sensitized with one part of silver nitrate in five parts of water, a strip of sponge being used; but in this case the sponge should be held in a light wooden clamp, such as may readily be constructed with two pieces of cigar-box wood and elastic bands or string. When fixed in a ten per cent. “hypo.” bath, and not toned, the prints have a pleasant warm brown colour. If, however, a grey tone is preferred, the prints should be well washed before fixing, and toned in a solution made by dissolving fifteen grains of chloroplatinite of potassium in a pint and three-quarters of water and adding five drops of hydrochloric acid.—*Photographic Work.*

## Imperfection in Paper.

WHETHER faults occur the cause must be ascertained before trying a remedy. In printing, faults of all descriptions occur. Often they are attributable to the printers' mode of handling, sometimes to the employers' parsimony, and sometimes to the inherent faults of even the best made material. That of which we know least usually gets all the blame, and paper has had a lot to answer for in the past. So much culpability, however, is not merited by paper. Faults it undoubtedly does possess, and one of them is the occurrence of a large number of spots, which break good prints, especially those from photo-zinc blocks. These spots have been the subject of very close investigation in France, and from the elaborate account in the *Bulletin de l'Imprimerie* it seems highly probable they have detected the real cause of the mischief. In the enquiry the spots and lines were magnified by a hand lens, and then cut clear from the paper. The detached hardened portions were put under a microscope and thoroughly examined. The examination proved the presence of a number of small paper fibres, which during making had not been felted in regularly with the main body of the paper, but had been left and had gathered in spots. Paper-makers, however, were not inclined to accept that version of the case, and their disbelief led the Frenchmen to further tests, one of which was sufficiently conclusive to prove the case against paper. The details of it were simply that a chromo-lithograph was printed on two varieties of paper. These varieties were so in the strictest sense, being alike in appearance, weight, and handling, but they had been purchased from separate sources, and in all probability were from different mills. Suffice it to say that the experiment showed one kind of paper to be spotty and injurious to good printing, whilst the other was clear. This entirely broke down the assumption that the spots were caused by dust.

There are spots of various kinds in paper, such as those arising from the presence of specks of india rubber and particles of iron, which, though detrimental to good work, do not do so much mischief in printing. The dark spots of concentrated fibre, investigated by the Frenchmen, actually protrude from the paper, and when printed upon leave a white break in the work all round them. The pains taken to solve this one point only should be an example to others to go deeply into any difficulty they may have, and not glance superficially on the subject before giving a hasty and comfortable opinion.

CLEANING AND PHOTOGRAPHING OLD OIL PAINTINGS.—A writer, who has had experience in copying oil paintings, gives the following as his mode of cleaning old paintings previous to their being photographed: “After dusting, wash the painting with a sponge and rain water, and then sponge over the surface the following: the white of two eggs, beaten up and cleared, a tablespoonful of glycerine, and half a litre of water. The object of adding the glycerine is to prevent the albumen from drying in spots, which would appear dull, and prove of injury to the reproduction.”



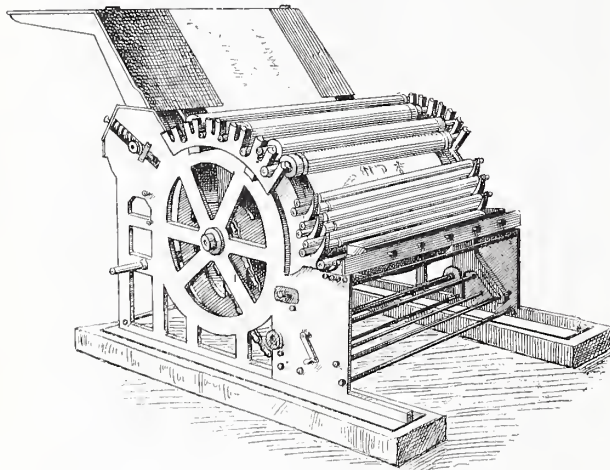
## Rotary Machines for Zinc Plates.

A SCOTCH INVENTION.



Y invitation of the patentee, the mechanism and working capacity of a new zinc plate rotary machine have been recently examined, and we take the opportunity to describe in detail one of the simplest yet most effective machines of the class which has been placed before the printing world.

It is some four years since the patentee, Mr. James McAleese, of Glasgow, first conceived the idea. He was a lithographic machine manager with a prominent firm in that city, and his invention is constructed upon purely practical lines, such as one might expect from a thoroughly practical man. From the first dawn of the idea, he gradually built up his plans, and in concert with his brother, made a model machine to print royal quarto sheets. The model is twenty inches wide, and twenty-four inches long on the bed. The feed-board makes the machine some six inches longer. In February, 1892, a patent was applied for, and in November of the same year, the complete specification



McALEESE'S ROTARY FOR ZINC PLATE PRINTING.

was filed. In January of the present year, the patent was accepted, and is in the satisfactory position of being on the market for any firm or company to purchase. Machines of this character are already in the market, and in an early number of this journal, the American "Huber" rotary was fully described and illustrated. Marinoni, the French machine maker, also brought out a patent rotary some few years ago. But the advantages of this new rotary lie in its compactness and simplicity.

The illustration shows at once the smallness of the machine, but it does not show the careful arrangements of the parts to secure all that is necessary for accurate

printing. The large cylinder carries the zinc plate, the damping table, and the inking table; whilst the paper is fed down the board to grippers on another cylinder, under the feed-board. These two cylinders rotate exactly at the same speed, and the paper is pressed against the zinc plate between the two cylinders as they rotate in opposite directions. The spring near the feed-board is adjusted as in ordinary lithographic machines, to force the paper cylinder against the large cylinder carrying the zinc plate, etc., and thus gives the necessary pressure for a good impression. The three divisions of the large cylinder are well marked. Two divisions are about the same size, each occupying about three-eighths of the circumference, and extends across the outer surface of the cylinder. The other division occupies the remainder.

The zinc plate is held tightly over about three-eighths of the cylinder's surface, by grippers inside the cylinder and extending across its lengthwise. By a little ingenuity arrangements can be made for almost any size of plate. The remaining five-eighths of the surface of the cylinder are allotted to inking and damping surfaces, the former taking about three-eighths, and the latter one quarter. The inking surface receives its ink from the set of rollers (with riders) shewn at the front of the illustration; these rollers being fed from a trough or duct by an oscillating duct roller, and the whole set so geared by chains, that it only revolves when the inking surface is adjacent. The inking surface carries the ink to the distributors and inkers in the three slots nearest to the feed-board. The damping trough and blanket damping roller are behind and below the cylinder, immediately under the paper cylinder. The moisture delivered to the inking table is taken up from it by the damping rollers in the two slots, in front of the inkers and distributors. In the ordinary course of working the paper is fed down the board and carried downwards between the two cylinders, is printed while in contact with the zinc plate, and is then delivered under the feed-board. The large cylinder continues to rotate, and is damped and inked ready for the next impression. During the revolution also, the inkers have received a small supply from the duct, having carried it to the cylinder, and the top set of inkers and distributors have been in contact with the inking surface, and have a fresh supply of ink on; the damper has also been in contact, has damped the surface, and this in turn has moistened the top set of dampers for a second revolution. Although this is all going on together, it is impossible, except by breakage, for anything to go wrong. Each set of rollers has a certain size of runners and lifts, and can only come into proper contact at its determined place and time. To put the zinc plate in position, or at any time to attend to the drawing, the whole set of inkers and duct can be drawn away upon wheels and slides which are not indicated in the drawing. The machine is driven from one shaft, and there are no belts about it. The driving wheels are cogs and chain, and are all within the framework. Danger is minimised, and the best class of work can be obtained from this compact, clever, and workman-like invention.







# What is Colour?

## CHAPTER X.

### CONTRAST OF COLOUR.

MAKING the introductory remarks of chapters VIII. and IX., it will be far easier to enter more closely into the relations and contrasts of colour, caused by their juxtaposition. These contrasts of colour fall naturally into two divisions, viz.:—(1) The simultaneous contrast of colour. (2) The contrast of tone. The simultaneous contrast of colour is the physical effect which the presence of one colour has upon another, in actually altering the colour sensation of both. The contrast of tone is the variation of depth produced by placing colours of different strengths side by side.

#### (1) SIMULTANEOUS CONTRAST OF COLOUR.

There are so many possibilities which crop up in all natural contrasts, that it is better to leave out of consideration, as far as allowable, any attempt to classify the simultaneous contrasts of nature, and deal only with the contrasts of surfaces covered by a pigment. In so ignoring natural colours, it is readily admitted that few, if any, pure colours exist in natural objects; whilst pure colour sensation can be given by pigmented surfaces, as far as is necessary for the study of contrasts. Again, in nature it is difficult to find an object giving an unmixed blue, red, orange, greenish-blue, greenish-yellow, etc., sensation. It is only when pigments have been refined that foreign matters are eliminated, and surfaces produced from such pigments have a constant colour sensation.

The first contrasts, which are of the simplest order, are the contrasts by juxtaposition of the complementary colour sensations, whether they be pure primary colour, or secondary or tertiary colour combination.

The contrast of black and white is in every way the lowest in complication and the greatest in effect. White being the presence of all colour, and black the absence of all colour, there is no possibility of either giving rise to imaginative colour sensation, and the result is to make both more intense.

Next in simplicity is the contrast of complementary colour sensations. Take as an example red and green. To study this contrast, fairly large pieces of flat unglazed paper should be evenly tinted with both colours, and the sheets placed side by side on a neutral background of black or grey. It must always be borne in mind that however neutral the background may be, it has an effect—although a very small one—upon the colours experimented with. The red and green sheets placed side by side simply intensify one

another. The red is only capable of reflecting red combined with white. The green is only capable of reflecting green combined with white. But it has already been shewn that if an eye be exhausted by gazing on red, it will then become sensitive to a bluish green colouration without such pigment being present. In this case, however, the green is side by side with the red, and the colour sensation of bluish green, from nervous exhaustion, is intensified and itself intensifies the green pigmented surface under view. In the same way the act of gazing upon the green causes a sensation of red to be excited in the colour vision, which intensifies the red pigmented surface in juxtaposition. These imaginative colour sensations arise from the percentage of white light reflected from both surfaces, as already explained in chapter VIII. It is needless to analyse each pair of complementary colours in the same way, because, as each pair of complementary colours should in a sense neutralise one another, by forming white on combination, the effect of intensification has its cause in the same simple manner.

Turning, however, to dissimilar colours, which are not complementary, a different series of phenomena become apparent, and it is to such simultaneous contrasts that the following remarks are confined.

The knowledge of such contrasts is most important to artists, for every artificial colouration of objects must depend for its harmony upon these simultaneous contrasts by juxtaposition. And, in the same connection, it should be borne in mind that human sensations are subject to curious variations by exhaustion. The sense of touch becomes less acute as the pressure of an object is continued. The flavour of the first few morsels of a dish gradually becomes less apparent towards the close of the meal. Intense heat becomes more bearable as it is continued for a longer time. And so with the eye; if it gaze upon a brilliant red piece of material, the exhaustion is so palpable, that after gazing on six or seven similarly coloured pieces, the last actually appears considerably less brilliant than the first.

Whether these variations are carried into another direction as regards sight cannot at present be stated with certainty. But what holds good for one sensation, is very probably true of the others. The variation here alluded to, is the effect of listening to an organ. Each large pipe of an organ—and probably the smaller ones—after it has given forth the note for which it is made, also gives forth the third, fifth, and octave—and sometimes the third above that—all of which reach the ear in quick succession, and constitute the grandeur and richness of organ music. The sense of hearing is a rhythmic one, and is comparatively slow. The sense of sight is no less a rhythmic one, but is very rapid. Whether light is accompanied by such variation as referred to in sound is not yet proved, but it is equally probable that the richness of many colours depend upon successive causes of a higher or lower variation. It is at least certain that the presence of any colour causes the virtual (or imaginary) appearance of some other colour sensation, and that is the point directly under discussion.

To illustrate the nature of these simultaneous contrasts of colour, the actual experiments of Monsieur





M. E. Chevreul (director of the Gobelin Factory) are perhaps not only more complete, but are more trustworthy than most others, owing to the verification which they received before being made public, or set up as actual colour sensations. Thus, when the following colours are placed side by side, or one around the other, or mingled, they have an effect as shewn:—

TABLE OF SIMULTANEOUS CONTRASTS.

I.	II.	III.	IV.	V.
The colours under inspection arranged in pairs.	The effect produced on each colour by the contrast.	The colour common to both, which is neutralised by juxtaposition.	The complementary colour of each in column I.	When added crosswise to each of the pair in column I., gives the sensation in column II.
1. { Red Orange	inclines to Violet	Scarlet	Green added to Orange gives	Yellow
2. { Red Yellow	" Yellow	"	Blue " Red "	Violet
3. { Red Blue	" Violet	"	Green " Yellow "	Green
4. { Red Indigo	" Green	Orange	Indigo-Violet " Red "	Violet
5. { Red Violet	" Yellow	"	Green " Blue "	Green
6. { Orange Yellow	" Green	Russet	Orange " Red "	Yellow
7. { Orange Green	" Yellow	"	Green " Indigo "	Blue
8. { Orange Indigo	" Blue	Orange	Orange-Yellow " Red "	Yellow
9. { Orange Violet	" Yellow	Yellow	Green " Violet "	Indigo
10. { Orange Green	" Indigo	"	Greenish-Yellow " Red "	Yellow
11. { Orange Yellow	" Bright Green	Yellow	Blue " Yellow "	Green
12. { Orange Blue	" Red	"	Indigo " Orange "	Red
13. { Orange Indigo	" Blue	"	Blue " Green "	Green
14. { Orange Violet	" Yellow	Russet	Red " Orange "	Red
15. { Orange Green	" Blue	"	Blue " Indigo "	Blue
16. { Orange Indigo	" Yellow	"	Orange-Yellow " Orange "	Yellow
17. { Orange Violet	" Indigo	"	Blue " Violet "	Indigo
18. { Orange Green	" Bright Orange	Yellow	Greenish-Yellow " Orange "	Yellow
19. { Orange Yellow	" Blue	Yellowish-Green	Indigo-Violet " Green "	Blue
20. { Orange Blue	" Orange	"	Red " Yellow "	Orange
21. { Orange Violet	" Indigo	"	Indigo-Violet " Blue "	Indigo
22. { Orange Green	" Yellow	Bluish-Brown	Orange " Yellow "	Orange
23. { Orange Indigo	" Blue	"	Red " Blue "	Indigo
24. { Orange Violet	" Yellow	Blue	Orange " Green "	Yellow
25. { Orange Green	" Violet	"	Red " Indigo "	Violet
26. { Orange Indigo	" Yellow	"	Orange-Yellow " Green "	Yellow
27. { Orange Violet	" Red	"	Red " Violet "	Red
28. { Orange Green	" Deep Violet	"	Greenish-Yellow " Green "	Yellow
29. { Orange Indigo	" Green	"	Orange " Indigo "	Violet
30. { Orange Violet	" Red	"	Orange-Yellow " Blue "	Green
31. { Orange Green	" Blue	"	Orange " Violet "	Red
32. { Orange Indigo	" Red	"	Greenish-Yellow " Blue "	Green
33. { Orange Violet	" Blue	"	Orange-Yellow " Violet "	Red
34. { Orange Green	" Red	"	Greenish-Yellow " Indigo "	Blue

In making such a tabulation of results, the question of good or bad contrast is not taken into account, it is simply a series of experiments from which any student can deduce the result of using any two or more colours together. Putting it as M. Chevreul himself sums it up: "Under these circumstances, each of the colours losing that (colour sensation) which it possesses analogous to the other, must be so much more different from it." Although the experiments are conducted with pigments, yet their power of exciting colour sensation is, in the main, the same as the analysis of white light by the spectrum, and to determine the colour which is analogous in both it is necessary to resort to the investigations on building up colours from spectrum colours. This will explain several of the peculiarities in column III. In drawing the conclusions in column II., M. Chevreul is of opinion that colours placed side by side have the effect of exciting their own complementaries, and the complementary sensation of the one is added to the other original pigmentary colour in each case, producing the wide divergencies of colour which result by

contrast. This theory is carried out in columns IV. and V., and although not apparently absolutely correct for colour mixing, yet relatively the results are accurate, bearing in mind that the sensations noted in column II. are merely inclinations and are not the full bodied colours which the names indicate.

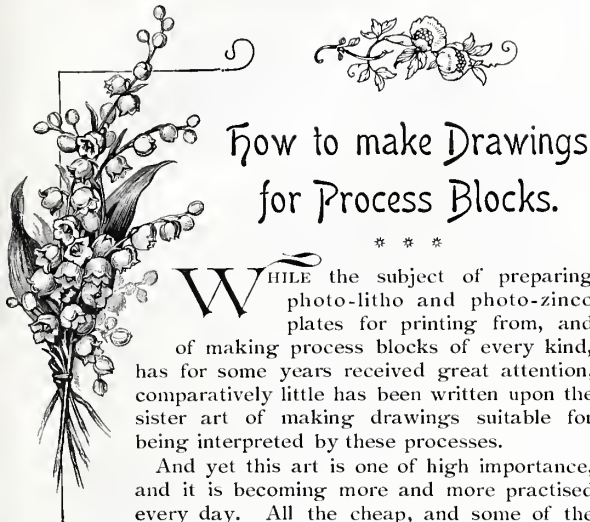
These phenomena of contrast hold good in a much more marked degree than do the results of placing

complementary colours in juxtaposition. The effect of contrasting the latter is often very misleading. Thus in placing orange and blue side by side, they should purify or intensify one another. Yet a second inspection may shew the blue to have a greenish cast, and a third inspection reveals it with a violet tone. The orange also suffers by successive inspections: at one time appearing yellowish, and at another time redder. In all the contrasts, especially of complementaries, not a little depends upon the particular shade of the colours in juxtaposition. When a green inclining more to yellow than blue is placed with various reds, the results are not en-

tirely a mere intensification.

- 18. { Green of a slightly yellow cast inclines to yellow.  
Red of slightly orange cast " orange.
- 19. { Green of a slightly yellow cast " blue.  
Red of a slightly crimson cast " violet.
- 20. { Green of a slightly yellow cast } " intensification.  
Red
- 21. { Green of a slightly bluish cast " yellow.  
Red of a slightly crimson cast " yellow.
- 22. { Deep blue } incline to appear redder.  
Yellowish orange }

ERASURES from cartoons or poster sketches, if made upon water-colour paper, can be effected by rubbing the surface with fine sharp glass paper. It is necessary to use plenty of new glass paper, rather than rub down a piece too much, as it will polish the surface of the paper and militate against good work being put on afterwards. In this way a square yard or so of inked and coloured work can be removed by hard work in an hour. The glass paper should be stretched over a well-cut flat oblong cork, such as used by a joiner.



## How to make Drawings for Process Blocks.

\* \* \*

WHILE the subject of preparing photo-litho and photo-zinc plates for printing from, and of making process blocks of every kind, has for some years received great attention, comparatively little has been written upon the sister art of making drawings suitable for being interpreted by these processes.

And yet this art is one of high importance, and it is becoming more and more practised every day. All the cheap, and some of the more expensive, periodicals have their illustrations made by process work; and even the high-class monthly magazines, which not long since spent enormous sums upon the preparation of their wood engravings, have at length found it expedient to avail themselves of the great resources of photography. Speaking for myself, I have not, during the past year, made a single drawing that has been engraved by the old and still admirable process on wood, but all of them have been done by reproduction on zinc, both in lines and in washes, the one to imitate ordinary woodcuts, and the other that of fine wash drawings in half-tones.

For a long time the Americans held, in public estimation, the supremacy in delicacy of tone in work of the latter class, as witness, for instance, the magazines of the Harper's class; but since the introduction of process work and the grated screen, with a like quality of paper and good printing, the English magazines can now not only hold their own against such powerful competitors, but in some instances, perhaps rare as yet, can even surpass them.

But what I aim at now is to give in this article a few hints and directions how to convert a photograph into a line drawing, which, when made into a printing block by process work, will yield prints which cannot be distinguished from an expensive wood engraving.

One must, of course, possess the ability to draw at least to some extent, and above all things he must have a faculty for tracing with accuracy, else will he be in danger of losing the likeness and expression when drawing a portrait. The hair, drapery, and general surroundings are of comparative unimportance, and a clever artist will convey much of these by a few touches. If one examines the portraits of public men that are prepared for newspaper illustration, he will not fail to notice how much is left to the imagination to supply, while at the same time the characteristic features of the original are readily recognisable. In landscape work this is of less consequence; what is here necessary is to preserve the salient features of a scene without crowding too much

into the sketch, and omitting or altering whatever is detrimental to artistic effect, such as badly placed trees or cattle.

There are two ways by which photographs may be converted into line drawings. The first is by special printing, taking care that it is not toned with gold in the usual way, but only fixed. Instead of albumenised paper, it is far better to use plain salted paper, a quantity of which may be prepared at one time, as it will keep good for a long period. This may be done by immersing it in water containing common salt dissolved in it in the proportion of about half an ounce to the pint. Some use chloride of ammonium instead of salt, but there does not appear to be much difference in the result. It should then be hung up to dry, and when quite dry placed in a portfolio for further use. To sensitise this paper, a sheet should be laid upon a piece of flat board or glass, and brushed or sponged over with a forty-five grains to the ounce solution of nitrate of silver in distilled water. There must be no metal about the brush, if such be employed in applying the silver. A few drops poured at the upper end of the sheet, which must in this case be held in a sloping direction, can be spread evenly by means of a glass rod; but if a dozen sheets are to be sensitised at a time it is better to pour the silver into a flat, square dish, and float the paper, smoother side down, on it for about two minutes, and then hang it up to dry. This must be done either in a room having deep yellow blinds, or by candle light. The paper is printed in the ordinary photographic printing frame until it is very dark, and the print is then washed in two changes of water, and fixed in hyposulphite of soda, one ounce to six of water. This will greatly reduce the vigour of the print. It should remain in this eight or ten minutes, and then be well washed in water. When dry it should be flattened by a smoothing iron, and then pasted by the corners to a Bristol board for convenience in handling. It is now ready for being drawn upon.

The ink for drawing is of the highest importance; and as this applies to every system of process work it is well to say a few words about it. It must be water-proof, and have such a degree of blackness that the faintest touch of a crow quill or a camel-hair pencil will tell in the after operations. That which is preferred by many process artists is the finest quality of Indian ink rubbed up in water to perfect smoothness. The water should be pure and made warm. The dish in which this is done ought to be heated until it feels unpleasant when the back of the hand is pressed against it. I have said that the water should be pure, but it should also be saturated before warming with bichromate of potash, which, as every photographer knows, will render the ink insoluble after drying. If liquid Indian ink, which is sold by artist's colourmen ready in a fluid form, is used, the bichromate should be added to it. When drawing with ink made in the manner directed it is the delicate, fine lines that require attention. They must be firm and black, or of a brownish-black colour—which does not matter. The stronger lines take care of themselves. For myself, I prefer Stephens' ebony stain, which can be got in sixpenny or shilling bottles.



The next thing is the selection of a suitable pen (for I will suppose that the draughtsman, in making his first attempts, uses a pen instead of a hair pencil). Joseph Gillott makes a variety of artists' pens, suitable for every class of work. If this is to be very fine, his No. 290 will serve the purpose. His crow quill No. 659 is also recommended by a high authority. A bolder pen may be used if the photograph is of a large size, and has to be eventually reduced to a fourth or sixth of its dimensions, for, as I shall afterwards show, many process blocks are from drawings which, for freedom of handling, are made more than four times the size actually required. But at present I am supposing that the finished block is of the same size as the drawing. I prefer for all-round work Mitchell's F pen, which I find is very easy to work with.

In drawing over the photograph cabinet size, which I will assume to be the head and bust of a gentleman, attention must be paid that nothing is omitted, and the direction of the lines must be studied from a good engraving.

The drawing being finished, the next thing is to discharge the photograph, which has served as a base for the tracing. Having unfastened it from the Bristol board to which it was attached by the corners, and ascertained that it is quite dry, place the photograph in the daylight for a few minutes if the light has not had access to it during the drawing. This renders the ink quite insoluble. Next immerse it in a saturated solution of corrosive sublimate (bichloride of mercury), which in a very few minutes will be found to have acted on the photograph with such power as to have caused it to disappear entirely, leaving only your drawing visible. Chemists tell us that the photograph is not really dissolved away, but is only bleached the same colour as the paper. But it has disappeared from view. The drawing is now washed in pure water which is free from any alkali.

Comparison must now be made between the pen-and-ink drawing and another photograph of the subject, which should be taken as a reference. A beginner in this art will possibly discover that he has omitted some important feature, not observed while the photograph still remained upon the paper, but this can only arise from carelessness, and will probably not occur a second time. He may, perhaps, also discover that from a like cause he has altered the likeness or expression; but much of this latter is capable of being remedied by the application of Chinese white to stop out offending lines, and re-touching them with black ink.

A second way by which photographs may be converted into line drawings is by superposing on the photograph a sheet of thin woven paper, which has been rendered temporarily transparent by brushing it over with benzole in which Canada balsam is dissolved, and making a tracing precisely in the way previously described. This tracing paper should be attached to the photograph by the upper end. It has this advantage over the other, that it enables you to judge of your progress by inserting a sheet of white paper between the photograph and the tracing, so that an examination can be made at as frequent intervals as you desire. When the tracing has been accomplished the paper is restored to its original white state by a

fresh application of pure benzole, which dissolves out the Canada balsam. Castor oil, wax, and a number of other substances may be applied to paper to render it temporarily transparent, methylated alcohol, or any other solvent of the substance employed, serving to restore the purity of the paper.—A. J. GOUGH in *British Journal of Photography*.

## Printing from Engraved Music Plates.



THIS class of work is chiefly in the hands of a few firms who make a special feature of music printing, and apart from these firms there are comparatively few litho printers who understand the methods employed to work from music plates. It occasionally happens that a lithographer, whose work is of the ordinary commercial character, receives an order to print a certain number of copies of music from plates supplied to him. The printing itself causes little or no trouble, but in endeavouring to get transfers on to the stone difficulties are sure to crop up, the plates being very different to the ordinary copperplate. The following is a method of procedure in general use, and by which good work is obtained:—

Music plates are made of pewter, in which the notes and words are not cut but punched into the metal, the engraver having a series of small punches corresponding to the different notes and letters. The inking-up is done by means of a dabber, the same as used for ordinary plate printing, and the ink must be good litho stone transfer ink, not too soft, or the transfer will spread. During the inking-in, the plate must be warmed over a gas stove; great care must be used at this stage not to get the plate too hot, or, as it is of very soft metal, it will twist out of shape, or even melt. When sufficient ink has been applied it must be carefully wiped off with a piece of soft rag, a final polish being given to the plate by means of the palm of the hand covered with whitening.

Before commencing the inking-in, a sheet of good unsized plate paper is well damped, either by a sponge or in the damping book; when the plate is sufficiently cooled, this damped paper is laid on, a clean sheet of paper is placed on top, then the usual blanket—which should be clean—and then pulled once through the copperplate press with a good, steady pull; if too much pressure is used the "pewter" will bend out of shape.

The transfer is next lifted from the plate, again damped on the back, and laid on a clean polished stone, slightly warmed, with the positions of each page previously marked off on it, and pulled once through the press under a good strong pressure.

When the paper is taken off the stone, the transfer is at once gummied up, a few drops of nitric acid having been added to the gum, and allowed to dry. The object of adding acid to the gum is to give to the stone a slight etch, which goes a good way towards clearing off any scum due to the plates having been kept any time in a damp place, and not properly protected. After the gum has been allowed to dry, the stone may be washed and rolled up, not rubbed, and treated as an ordinary litho job.





BY CHARLES HARRAP.

## CHAPTER IX.

## VARNISH.

**V**ARNISH, in the general usage of the term, means a thin liquid which, when spread out by a brush into a thin layer, dries by evaporation or oxidation into a hard transparent glossy film. Such an expression, however, is scarcely applicable to printing varnish, although the latter possesses similar characteristics, yet in the main a printing varnish need not be a varnish strictly speaking, but a medium in which a pigment can be ground to form an ink.

Leaving for a moment printing varnish on one side, and turning to varnish as a whole, its cursory study may be of value not only to printers, but to others in the trade. The purposes of a varnish are :—

- (a) To give lustre or gloss to the finished article.
- (b) To form a protection to whatever it is applied, against the effects of impurities as well as the oxygen of the air and damp.
- (c) To give a medium in which pigments can be ground for printing purposes.

The latter condition has a number of side issues which every printer is prepared to admit. Thus, it may not be altogether indispensable to print without varnish, as already alluded to in chapter VII., while the amount and consistency of varnish are points on which great divergence of opinion exist. As to whether printers' varnish is a real varnish is immaterial, the name has been applied and will remain. Ordinary varnish is used to protect and to give a gloss on metal work, painted or plain wood, printed or plain paper, leather, etc.; and to meet such purposes, a good varnish should fulfil the following conditions :—

- (1) That it adheres firmly to the surface on which it is laid.
- (2) That it dries hard and intact.
- (3) That it has sufficient elasticity and tenacity to withstand changes of temperature and ordinary—as well as extraordinary—shocks in usage which tend to crack it.
- (4) That it forms a glossy and durable surface.
- (5) That it dries quickly.

Whilst for printing it further requires :—

- (6) That it must be free from any foreign matter such as resin, which would give a hardness incompatible with printing.
- (7) That it retains a pigment firmly in its substance, and holds the same to the paper.

The substances which lend themselves most efficiently to all these conditions are the drying oils and resinous substances. Amongst the resins are amber, copals, kauri, soft manilla, lacs, dammar, elemi, copaiba, gurjun balsam, sandarac, mastic and rosin, all of which may be used to form varnishes. For some varnishes, however, such as printing varnish and some wood varnishes, drying oils alone are used, but in the majority of cases the varnish is really a resin rendered soluble. Some resins are soluble in drying oils, whilst others have to be rendered soluble by steeping them in a spirit or essential oil, such as wood naphtha, ether, ethylic alcohol, benzine, or turpentine, which evaporates from the finished varnish, and leaves the resin either held firmly in an oil, or, when in use, upon the article on which it has been painted, and has become firmly adherent by its own adhesive properties. This characteristic of resins seems to formulate a very close alliance between resins and drying oils—a resemblance not unlike that which exists between the solid essential oil known as camphor, and the limpid essential oils of caraway, neroli, bergamot, and turpentine. Now, drying oils do actually dry into a resinous substance. This seems to point to resins being really solid drying oils which simply require reducing to a liquid so that they may be painted on a substance, and will then dry into a perfect layer of material as nearly like a dried drying oil as can be. The main difference being that the resins are quicker driers, and do not contain any other substances which would give them the necessary elasticity as found in a good drying oil, such as linseed oil.

Varnishes can be divided into five distinct groups, as follows :—

- I. Natural varnishes (Chinese and Japanese lacquers).
- II. Fat oils drying by oxidation.
- III. Oil varnishes.
- IV. Spirit varnishes.
- V. Varnishes or polishes (furniture creams).

The Japanese lacquers scarcely need any description. Their appearance is well known. Their manufacture from the natural juice of the *Rhus Vernicifera* is kept a secret, but it is believed that this lacquer, even in Japan and China, will ultimately give place to the varnishes made in the west of Europe.

The second division of varnishes is that in which the printer is mostly interested. The oils used in the preparation should be the drying oils, the restricted list of which includes only poppy oil, walnut oil, hempseed and linseed oils. Poppy oil is scarcely ever used outside the manufacture of artists' colours, and is generally considered a slower drier than linseed or walnut oil. Walnut oil, or nut oil, can be obtained very little inferior to linseed oil, but commercial nut oil cannot be taken as a fair substitute for linseed oil. Hempseed oil is used for varnish making far more extensively in northern and eastern Europe than in the west. So long as linseed oil is available, hempseed oil will not come into general use. It is not so clean nor pleasant in manufacture, and would require more careful clarifying to fit it for the purposes of a varnish than linseed oil.

These oils cannot be used without months of preparation. The oil when obtained from the seed contains salts, gums, and water, as well as matter

which sets up fermentation, causing the oil to go rancid and spoiling its drying qualities. To rid the oil of these matters it should be heated very slowly, say to 300°C. (572°F.), and kept at that temperature for two or three hours. The clarifying process may be assisted by adding a very small quantity (not exceeding 5 parts to 1,000 of oil) of either caustic lime, carbonate of lime, calcined magnesia, or carbonate of magnesia. After heating it should be allowed to cool undisturbed, and finally to be removed to settling tanks, where it should be left as long as possible. It becomes paler, more limpid, and a better drier, the longer it is kept.

The first step in making a medium for inks is the preparation of boiled oil. In the old methods oil was simply boiled with litharge in the same cistern. Now, however, immense coppers like washing coppers, to hold 100 to 200 gallons, are built with a steam jacket to raise the temperature to about 120°C. Inside is fitted at the bottom a coil of pipe, pierced with fine holes to allow a constant stream of air, and above this coil are the stirrers, consisting of blades revolving in opposite directions. The stream of air is forced through the fine holes by a powerful pump, and immediately the air leaves the perforations it is carried away by the stirrers and thoroughly well mixed with the heated oil, causing oxidation to proceed more rapidly and effectively. Above the boiler is a dome to catch the fumes and carry them into a tall chimney, or into the ashpit of a furnace having a good draught.

With such appliances the cistern or boiler is half filled and raised to 100° to 120°C. (212° to 248°F.). The stirrers are set in motion and the driers slowly added. Lead driers have the disadvantage of discolouring the oil somewhat. Manganese driers are more powerful, and with a very small quantity of lead oxide, scarcely more than one per cent., are the best to secure a good, clear boiled oil. Such driers must be ground in oil to the utmost fineness before being added to the "boiling" oil. The admixture being complete, the air jets are turned on, the oil is boiled and stirred, and this process continued for some three to four hours. Samples can be taken out occasionally, and a practical man will know when the boiling has been carried far enough. By this modern process the time of boiling is reduced to one-third by the old process. The temperature in the old process was as great as would melt lead, and in the new process not much higher than boiling water; and finally the boiled oil is clearer by the modern process.

Notwithstanding these advantages, there are still some believers in the "good old English way" as we often hear people say, who cannot advance with the times. Possibly the modern process is not perfect, but it is only a question of time to reach the same perfection as of yore. If asked the question as to any differences in the old and new varnishes, very few printers or others could distinctly say they knew them; and so far as outward appearances go, the production of excellent chromo-lithographs does not seem in the least to change for the worse by the change in the mode of making the varnish.

In concluding this description of the preparation of "boiled oil," the following recipes are extracted from "Spons' Encyclopædia":—

**Recipe I.—Boiled oil with one salt of lead only.**

Linseed or nut oil . . . . . 1 gallon.  
Litharge . . . . . 1-lb.

**Recipe II.—Boiled oil with two salts of lead.**

Linseed or nut oil . . . . . 1 gallon.  
Litharge . . . . . ½-lb.  
Sugar of lead . . . . . ½-lb.

In recipes I. and II. the oil is raised (according to the old process) to 280°C. (536°F.), when the drier is gradually added, and the mass raised to 300°C. (572°F.), and kept at that heat for six to twelve hours, according to the intensity of the drying power required. After boiling, the mass must cool without being disturbed for about twelve hours, and then be carefully poured or ladled off the dregs.

All boiled oils improve by standing for some months after manufacture. The same holds good for varnish, which some dealers keep in stock five years before use.

**Recipe III.—Boiled oil with a manganese salt.**

Linseed oil . . . . . 1 gallon.  
Potassium permanganate . . . . . 100 grains.

This should be made in a boiler of enamelled iron. The oil is raised to 300°C., and the drier, ground in some of the oil, is gradually added. Each addition causes a violent frothing. Boiling continued two or three hours with strong and frequent stirring.

**Recipe IV.—Boiled oil with a manganese salt.**

Linseed oil . . . . . 1 gallon.  
Pure hydrated protoxide of manganese . . . . . ½-oz.

Raise the oil to 300°C. Grind the drier into some of the oil and add slowly to the hot oil. Keep the heat up until it begins to thicken when cold; discontinue boiling; thin down to proper consistency with some raw oil, and put by to deposit the sediment.

These recipes, III. and IV., may be treated as already described in the "modern" process, with a lower temperature, and with air blown through during boiling.

**Recipe V.—Boiled oil with salts of manganese and lead.**

Linseed oil . . . . . 1 gallon.  
Umber . . . . . 5-oz.  
Gold litharge . . . . . 5-oz.  
Red lead . . . . . 5-oz.

These ingredients are simmered for six hours together.

**Recipe VI.—Boiled oil with salts of manganese and lead.**

Linseed oil . . . . . 10 gallons.  
Permanganate of potash . . . . . 4-oz.  
Acetate of lead . . . . . 4-oz.

These driers are each dissolved separately in four pints of water. They are then mixed and added to the cold oil. The mixture is raised to 300°C., during which the water is boiled off. Whilst at this temperature samples are tested on glass, and as soon as a sample thickens a little on the glass the boiling is stopped, and the oil allowed to cool before storing.

**Recipe VII.—Boiled oils with salts of manganese and lead.**

Linseed oil . . . . . 1 gallon.  
Borate of manganese . . . . . 1-oz.  
Acetate of lead . . . . . 1-oz.

**Recipe VIII.—**

Linseed oil . . . . . 1 gallon.  
Manganese protoxide-hydrate . . . . . 1-oz.  
Red lead and litharge . . . . . 1-oz.

The recipes VI., VII., VIII. may advantageously be prepared by the process already described. In this modern process the agitation and the air streams cause the oil to froth up and fill the boiler.



The driers used are not restricted to those mentioned in the recipes. The driers may be :—

Lead acetate.  
Lead protoxide (litharge, massicot, etc.).  
Red lead or minium (protoxide and binoxide combined).  
Lead carbonate or white lead.  
Sulphate of manganese.  
Acetate of manganese.  
Borate of manganese.  
Benzoate of manganese.  
Permanganate of potassium.  
Protoxide of manganese (freshly precipitated).  
Peroxide of manganese.  
Intermediate oxides of manganese and their corresponding hydrates of manganese.

These boiled oils are in reality similar to printers' varnishes. The consistency of the boiled oil can be varied by continued boiling, samples being taken out and tested for each particular strength of varnish required. The consistency can be increased so near to solidity as to give the oil the character of a drier only, and it is made thus and used for that purpose. It should not be overlooked that the oil before boiling must be thoroughly clarified, as already described; and during boiling should any scum arise it is ladled off, but as a rule the waste matters settle in the boiler, and the oil can be removed from them.

In chapter VIII. the reasons were given for boiling and burning linseed oil, and in the present chapter the full details of preparing a boiled oil—of course containing driers—have been described. Although boiled oil is to all intents a printing varnish, yet there is a variation in treatment for pure oil varnish from that given. The printing varnish should be prepared solely by boiling oil without driers, and ultimately removing its objectionable qualities by burning. It has been shewn that clarifying the oil gets rid of much of the mucilaginous matter; that forcing air into it whilst boiling assists in oxidising or thickening it; and that when boiled it is allowed to cool undisturbed, the heavier impurities being thus removed by settling. But when the oil is boiled without driers, in a similar boiler to that already described, the boiler must be fitted with a hood, and when the boiling oil emits heavy fumes, these fumes must be ignited and allowed to burn for a given time. By this means the non-drying oil is burnt out, and the gummy matters remaining are reduced to a scum or ash upon the surface, which is skimmed off. When the oil has boiled and burned down to a considerable extent—a state only known by constant experience—the flames are extinguished by bringing down the hood and choking them. A sample should then be tested, and if it does not draw stringy, and is thick enough, it can be drawn off for thin varnish. In preparing medium or middle varnish the burning is allowed to proceed longer, and when a sample draws stringy, the strings not drawing more than about one foot, it is fit to use as medium varnish. Further burning will produce thick varnish, when a sample draws out to strings a yard long. Finally, the extra strong varnish is made by still more burning.

The quality of varnish depends upon each individual varnish maker's own particular recipe of preparation. Varnish makers guard their own methods with the utmost secrecy, and it is only possible here to give but

the mere outline of a process which has become almost the monopoly of a few firms. Such a monopoly does not perhaps environ printing varnish so much as it does the very fine coach and wood varnishes, and Brunswick black or similar jet black varnishes, manufactured in this country, which have become not only noted in this country, but are known and highly appreciated in most parts of the world.

## CHAPTER X.

### OTHER VARNISHES.

Lithography is not only dependent upon boiled oil or varnish for a medium for its pigments, but the brilliance of the finished prints very often depends upon the application of a true varnish.

Such varnishes perform the double duty of giving a glaze and protecting poor bronze, preserving poor pigments and protecting even good pigments suffering from the effects of direct contact with pure or impure air and damp. In many instances, therefore, a finishing varnish is a necessity.

The varnish used may be an oil or spirit varnish. The oil varnish is in most respects similar to wood varnishes, the mode of manufacture of which is kept such a secret. Suffice it to say that it is these varnishes which are compounded mainly with an oil and a resin. The four following recipes give some idea as to their nature :—

#### Recipe IX.—Palest amber picture varnish.

Palest transparent amber .. .. .	1 part.
Palest old linseed oil .. .. .	1½ parts.
Fresh distilled turps .. .. .	3 parts.

These are boiled slowly at a low temperature, until the compound draws stringy to a considerable length.

#### Recipe X.—Body copal varnish.

Palest Zanzibar animi .. .. .	1 part.
Linseed oil .. .. .	3 parts.

Boiled into a varnish and added to a varnish made of :—

Sierra Leone copal .. .. .	1 part.
Linseed oil .. .. .	3 parts.

These two varnishes when mixed are boiled to form the final varnish, which should draw stringy; it is then diluted with twelve parts of turps.

#### Recipe XI.—Niel's picture varnish.

Very best African copal .. .. .	1 part.
Linseed oil .. .. .	2½ parts.
Turps .. .. .	3 parts.

#### Recipe XII.—Gold size (varnish).

Amber or copal .. .. .	1 part.
Linseed oil .. .. .	2 parts.

In both XI. and XII. the materials are boiled down to become stringy. Then add six parts of strong drying boiled oil. Boil down again to a very stringy consistency, and finally dilute with ten to twelve parts of old turps.

These oil varnishes are made under very difficult and trying conditions, for the resins used require the utmost care in picking, cutting, and preparation, before they can be added to the oil. The fusing of the resin alone is a delicate process, and has to be carried out to a fine point of discrimination, so as to get the real quality of the resin to form the varnish, rather than the natural qualities of the resin. The



boiling is executed as already described, but each quality of varnish, as well as each variety of varnish formed by different resins, requires very different treatment as to heat of boiling, time of boiling, and consistency of the finished article. Varnishing is best done by using the hot varnish on a hot article; but since that is generally impossible, it is thinned with turps when removed from all sources of ignition. The turps being put in little by little, and stirred only into the upper part gently. Ultimately, the turps becomes incorporated.

The spirit varnishes, which are very largely used in most printing establishments, are prepared almost solely by rendering a resin or gum soluble in a spirituous medium, which ultimately evaporates from the varnish, and leaves the gum or resin in a thin impenetrable film over the object. Such varnishes dry spontaneously and are usually very brittle, being the hardest artificial varnishes except stoved enamels. Their brittleness may be decreased by the use of a toughener. One toughener is sufficient, and should be used in the following proportion to the quantity of resin used :—

Toughener.	Per cent. proportion to be used.
Cold drawn castor oil .. .. .	5 to 10.
Copaiba balsam .. .. .	5 „ 20.
Venice turpentine .. .. .	10 „ 50.
Camphor .. .. .	2 „ 10.
Oil of lavender .. .. .	10 „ 25.
Fat oil turps .. .. .	10 „ 50.

The making of such varnishes requires only ordinary tact. Special appliances and knowledge are not required. As a rule they should be prepared in glazed ware—glass, earthen, china, or porcelain. The following recipes shew the nature of some of the most useful spirit varnishes :—

Recipe XIII.—Pale lac varnish.

Bleached lac, freed from wax .. .. .	1 part.
Methylated spirit .. .. .	3 parts.

The lac, powdered coarsely, is dissolved by gentle heat in the spirit. Filter whilst warm, and cover the funnel to prevent evaporation. Allow to settle till clear and bright.

Recipe XIV.—

Shell or button lac .. .. .	8 parts.
Palest soft manilla copal .. .. .	6 „
Copaiba balsam .. .. .	2 „

Powdered as in XIII., and dissolved in

Strongest spirit .. .. .	40 parts.
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Recipe XV.—

Lac .. .. .	5 parts.
Sandarac .. .. .	2 „
Elemi .. .. .	1½ „
Venice turpentine .. .. .	2 „
Spirit .. .. .	24 „

Recipe XVI.—

Lac .. .. .	6 parts.
Pale resin or American .. .. .	3 „
Sandarac .. .. .	1 part.
Castor oil .. .. .	2 parts.
Spirit .. .. .	30 „

Recipe XVII.—

Bleached lac, freed from wax .. .. .	10 parts.
Mastic .. .. .	6 „
White dammar .. .. .	4 „
Oil of lavender .. .. .	8 „
Spirit .. .. .	50 „

These three are prepared just as No. XIII. or XIV. The following recipes are almost devoid of lac.

Recipe XVIII.—

Palest soft manilla copal .. .. .	4 parts.
Manilla elemi .. .. .	1 part.
Spirit "dried" .. .. .	12 parts.

Prepare as No. XIII., only using strongest "dried" spirit.

Recipe XIX.—

Sandarac .. .. .	4 parts.
Palest soft manilla copal .. .. .	4 „
Copaiba balsam .. .. .	2 „
Castor oil .. .. .	1 part.
Spirit .. .. .	25 parts.

Prepare as No. XVIII. or No. XIII.

Recipe XX.—A pale cheap varnish.

Sandarac .. .. .	2 parts.
White dammar .. .. .	2 „
American "thus" .. .. .	4 „
Soft manilla copal .. .. .	4 „
Elemi .. .. .	4 „
Spirit .. .. .	40 „

Recipe XXI.—

American "thus" .. .. .	4 parts.
Benzine .. .. .	2 „
Manilla elemi .. .. .	2 „
Sandarac .. .. .	2 „
Spirit .. .. .	25 „

These are powdered, mixed, and filtered after solution.

In preparing, these spirit varnishes are heated gently in a closed vessel, and when finished are kept corked up. The sandarac, elemi, mastic, and balsam are used to counteract brittleness, as well as one of the tougheners.

The use of spirit varnishes is a matter attended not altogether with the best effects upon those employed in it. Just as the collier breathes small particles of coal into his lungs, and as the weaver inhales small threads of cotton which cause the well-known weaver's asthma, and particles of bronze powder get into the lungs of the printer, the spirit varnishes also attack the lungs with possibly equally deleterious results.

The ruling passion of the day is cheapness, and that means a poor spirit for the spirit varnish. This spirit has a most pungent odour, which affects the eyes, dries the skin both outwardly and inwardly, and has a semi-intoxicating effect upon many who are daily engaged either in the occupation, or in an air impregnated with it. By way of comparison, the effect of spirit varnish—that is the constantly escaping spirit in the air—is similar to putting ether on the skin, or continually using menthol, or rubbing the skin with camphor. It is constantly drying and cooling the skin by causing all the moisture to evaporate. Similarly, it is drying and cooling the lung tissue. Human tissue must be enveloped by a thin film of moisture, just as this earth is with air, to prevent sudden changes having a too sudden effect. If this film be removed, the human tissue is not proof against inflammation of the lungs, or pleurisy. It may be argued that spirit preserves tissue, and that drinkers of good rum preserve themselves to a good old age. But the actual preservation of dead tissue in a complete bath of spirit, and the drinking of rum, are quite different to the irritating vapour in the air. Probably such considerations, as well as the further desire to minimise cost, have been the outcome of the varnishing machines used in America and this country at the present time.

Printed with Mander Brothers' Lithographic Inks.  
On Smith & Co's Improved Celebrated Chromo Paper.

Works - Wolverhampton.  
Johnstone, Scotland.



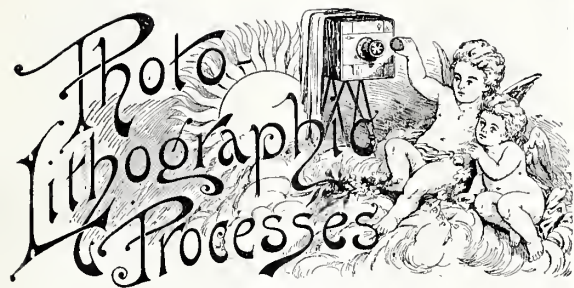
Colour No 3. Green.

Specimen of Chromo Lithography in 11 printings, drawn direct and printed at  
machine from plates Manufactured by the Patent Lithographic Zinc Plate Co Ltd Hull.

OF MANDER BROS LITHO





COLLOTYPE (*continued*).

## CHAPTER XIV.

## EXPOSING FOR PRINTING THE PICTURE.



THE sensitized plates prepared in any of the ways already described may be used at once, or may be kept for a week or so. The printing of the picture upon the sensitized film must be done in a special box printing frame. A printing frame similar to that used by photo-zinc etchers is as good as anything specially constructed for collotype alone. The ordinary photographer's spring frames are quite useless. This box printing frame should be deep and well made. The glass front must be sound thick plate. When this has been thoroughly cleaned and placed in position, it is bordered by a brown paper mask of a size just large enough

to admit the picture on the negative to be thoroughly exposed. This mask not only assists in giving a clear margin to the picture, but it is absolutely necessary to have it there to protect the edges of the sensitized film from exposure to light. If they become exposed they will take ink in printing in the press and be a constant source of trouble. The brown mask having been placed upon the plate glass, the negative is next laid in the centre of the space thus left, the negative must also be masked with very thin tinfoil along its edges, to cut out the picture quite clean and sharp upon the collotype film. This tinfoil can be secured with flour paste, any liquid glue, or indiarubber solution as now sold in tins for bicycle tyre repairs. If the negative should be a "film," then opaque paper will serve as the masking material. The negative being in position and everything dusted scrupulously clean, the sensitized collotype film is placed upon it. On the back place one or two thicknesses of blotting paper, and then place in the back of the frame. This back is quite loose, and is fitted simply into the box frame as accurately as possible. Over the back two or more bars are hinged and brought down into position to be locked; or are also loose and are slipped under claws at each side. When slipped under or locked, the back is forced down upon the plates within by two or three powerful screws in each bar, working through

threads in the bar and exerting any amount of pressure upon the back. Smaller frames,  $8 \times 10$ -in., should have at least two bars, with two screws in each. Large frames— $12 \times 15$ -in.,  $14 \times 14$ -in., and  $15 \times 15$ -in.—should have quite a close series of four or five bars with three screws in each. Such description is given because the same frame should be made to suit photo-etching on zinc, and in both processes absolute contact with the negative during printing is of great importance. Care must be exercised in putting on the pressure, or the negative will break, unless it is a film negative. It is not possible to observe the printing, as in either ordinary photography or photolithography on paper, by removing the back and turning up one side, so recourse must be made to the methods mentioned fully in Chapter I. (p. 26 B.L. No. 2). For preference a second or dummy frame, with a negative and collotype plate, is the more accurate plan of timing the exposure. If, however, the Johnson's Actinometer be used, and carefully attended to, success is almost certain. The actinometer should be allowed to register six or seven tints, after which the printing frame may be carefully examined from the front. When fully exposed the image can be seen through the "whites" of the negative as a brown printing in distinction to the pale yellow of the original film. If a dummy frame has been used, the collotype film could then be taken out of it and developed, to see that the exposure was correct, before attempting to manipulate the film specially in preparation.

Although more necessary for other photo-mechanical processes, there is no reason why collotype should not be treated with the same exactness, especially as the printing frame contains a plate glass, a space due to the brown paper mask, the negative, a space due to the mask on the negative, and the thick, spongy, semi-transparent film on the collotype plate, all of which must have a tendency to allow the dissemination of light in lateral as well as perpendicular directions. It is better, therefore, to confine the printing frame within a white cardboard square prism or square tube, so that the light is brought to bear more directly upon the picture and to pass more directly through the negative. Such a prism need not be immoderately tall; its use is liable to increase the time of exposure by a small amount.

The print having been made, and the collotype film plate removed from the frame, it is not a bad plan to turn the printed face downwards upon black velvet, place a piece of ground glass on the back of the polished glass, and allow it an exposure in diffused sunlight for, say, fifteen minutes, to partially harden the sensitive film to the substratum. That done, the whole plate is placed in clean cold water. The water being changed every half-hour or less, until the yellow bichromate has been entirely washed out of the film. This may be done perhaps better in Jeffrie's Patent Perfect Washer, or in the ordinary washing rack used for negative washing.

The film, now shewing the picture as a brown image, all yellow having been washed out, is allowed to dry and harden to a small extent. It would be impossible to proceed with the rolling-up before the

gelatine, softened by so much soaking, had dried to a considerable extent. In some cases, when experience has proved that the gelatine is too soft, it is advisable to soak the film after washing for a quarter of an hour in a one per cent. solution of alum, after which it must be again well washed, then gently blotted comparatively dry with tissue paper and allowed to dry thoroughly for a day or two before printing from it.

At this point the description can be left to deal with other matters which must be in readiness before the printing can be proceeded with.

## CHAPTER XV.

### PRESSES, BEDS, MASKS, ROLLERS, AND INK.

THE printing from collotype films has so much in common with lithography, that it only requires a few alterations and the exercise of a greater amount of care by any one well versed in lithography to execute good work. Collotype may be printed in a lithographic press, in an Albion letterpress, or in special presses made for the purpose. Some amateurs, as well as professionals have had very considerable success in using the Albion press, by simply letting down the platen to reduce the space. The ordinary lithographic press seems to be as readily converted as any form of press, and it lends itself more to the adaptation. Such a press should have a fine brass or zinc tympan, and the scraper should be shod with leather. The scraper should always be shorter than the width of the plate, but longer than the picture thereon. In collotype printing the pressure cannot be so great as in lithography, which necessitates the tympan being flexible and the scraper absolutely true.

If either the letterpress or lithographic press be used, then a separate appliance has to be used, called a mask, which is simply a sheet of oiled or sized parchment paper, with an aperture cut in to allow the picture only to be printed. But both the letterpress and lithographic press can be fitted with a hinged frame to carry this mask, and always secure rapid printing with accurate register.

Such a press has been made by Poirier with R. Schlegel's special attachment to secure ready and rapid masking. This press consists of an ordinary carriage with two tympan frames, the inner one being small enough, with all its gearing, to fit inside the other frame. The collotype plate is placed on the bed, and held in position by clamps; and during the adjustment of the press the plate may be covered by a wooden box, which is forced or slid off during printing by the advancing scraper. The inner tympan frame is really the "mask frame," with slots in its long sides to receive screw bolts, the nuts being outside. These bolts are connected to a strip of fine zinc stretching across the frame, and held by two similar bolts in a slot the other side. There is a strip of such zinc at each end of the frame, and they can be tightened by screwing the nuts outside the frame. They can also be moved either way to take in larger or smaller pictures. Two similar strips of zinc are clamped at the hinged end of the mask frame by clamps which are also movable in slots. At the free end of the frame, however, the zinc strips are

fitted with hooks, whilst another set of hooks can be hooked into any of the holes made for the purpose in the bar forming the end of the frame. The tension is put on the zinc in this direction by connecting the two sets of hooks by strong indiarubber bands. In this manner the four strips of zinc cross one another, and leave an oblong or square opening, which can be made any size to suit the size of the picture. The inner or picture edges of the zinc strips are finely feathered and covered with bank post paper to avoid bruising the film. The "mask frame" fits down upon the collotype plate, and the paper is placed in perfect register to lay marks upon the zinc strips; the next frame then fits down over both and brings an elastic or rubber tympan to bear directly upon the backing. The zinc tympan, which is only fastened to the hinged end of the "elastic tympan" frame, is then brought down on the top and the impression taken. Such appliances can be just as easily added to a lithographic press, with a little expense, instead of purchasing any special press for collotype alone.

If, however, a mask frame is not added, then masks must be prepared by stretching thin parchment paper over an oblong iron frame and securing it with paste or glue. The paper after damping stretches out very tightly, and when dry should be gold sized upon the under surface which will have to lie on the film. When perfectly dry any size of opening can be cut in the mask to suit any size of picture, and with good luck one of these masks may last for a thousand runs, although there is often a run of ill-luck, and at least six masks may be used and spoilt in the same time. It is necessary to always have plenty of masks in stock.

The collotype plate may be held in various manners in the press for printing. In the special presses it is held by clamps, and can be placed upon a sheet of blotting paper to assist in watching the rolling up. In the Albion press a sheet of plate glass is first put down on a sheet of blotting paper, and upon this plate a sheet of damped blotting paper is placed, and upon this the collotype plate will bed with security. A similar course can be followed in a lithographic press, although the better way is to place a stone in the press and get it perfectly level, then make a seating of plaster of Paris upon it, and imbed a sheet of plate glass in it. This glass serves the purpose of the lower glass in the Albion press; for by damping this glass and placing a sheet of blotting paper on it, the collotype glass will then lie quite securely for printing.

There is however another method, not unlike a combination of the special press system with the last named, which was introduced some four or five years ago by the writer. It consists of a perfectly planed sheet of iron, at least one half inch thick. To the under side are secured two angle iron strips, which hang down and form a means of wedging the plate fast to a stone on which the plate is laid. The plate is perforated by two parallel rows of tapped holes in its length, and two similar rows in its width; about three inches apart for a plate to take a collotype plate 8 x 10-in. The holes are as near to one another as convenient, the distance between them being overcome by using flat blocks of iron not exceeding  $\frac{3}{4}$ -in.



thick, with a slot in them, and secured in position in any of the holes by a screw tightened from above, and having a head so small as to fall into the slot (upon a ledge in the slot), and be even lower than flush when properly fastened. In this manner the iron blocks can be moved from hole to hole, and moved by their slots to the very finest contact with any size of plate. In using this iron bed, it is necessary to underlie the plate with blotting paper. It has been determined that the ordinary scrapers are quite equal to collotype printing, although at one time the original American work was done under a scraper consisting of a steel roller covered with india-rubber.

The rollers used for collotype are very simple. There was a leaning at one time to the use of a velvet roller, but this became a very expensive fad, for after the velvet roller had been used a little while it became so clogged that it was quite impossible to get it back into working order. Collotype films are undoubtedly of a delicate nature, and the work is very fine. But grained stone work is also very fine, though the stone is not so delicate as the film. However the same fine nap roller which is used for very fine chalk work can be used for collotype work, and may be considered actually the best for the purpose, notwithstanding the favour which is shown to glue or india-rubber rollers. The main point is to load the work with ink, and that can only be properly done with a roller which goes down into the grain of the film, and touches every particle of the photograph. When that has been done, the picture must be cleared of its superfluous ink by rolling over it quickly with a glue roller. This roller takes the ink from the heavy parts and puts it upon the lights which were not fed by the nap roller. Schaarwächter gives the following composition for the glue rollers, which are cast in seamless copper moulds, like letterpress rollers. Brown glue, 3 lbs., steeped in cold water for two days. After steeping, the pieces should be taken out and dried in a cloth; then dissolved by raising, over heat in cold water. To this add 1 lb. of treacle, previously boiled. Continue the heat, and boil both together and skim. When clear and well boiled together it is run into the mould with the iron stock in the centre.

Although drying the film can be done with a cloth as in lithography, yet that course is liable to scratch or drag the film, and it can be well supplemented, if not substituted, by the use of drying rollers, made with a covering of wash-leather or cloth. Such covers should be readily interchangeable for dry ones.

The ink for collotype must be as fine as possible. The very best chalk ink, let down to a nice consistency with thin varnish, makes a good-working collotype ink.

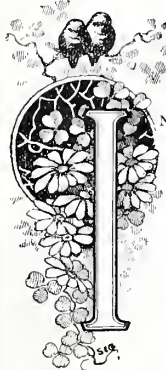
MR. WORRALL, the chemist at the Thorncliffe Collieries, has recently discovered a substance in coal which so far is considered a better disinfectant than carbolic acid—also obtained from coal. The new substance is termed "Izal," and is not soluble in water.

A POPULAR method of preserving pencil marks consists in coating them over with a solution composed of collodion, with two parts stearine.

## Lithographic Printing Machinery in France.

BY A. VALETTE.

### PART IV.



IN a preceding article we considered the automatic points as used for all lithographic work, that is, the thick points varying in height and distance. These are designed to obviate the results caused by certain qualities of paper, which, in spite of all precautions during the printing, expand or contract according to the temperature of the workroom, and the veriest tyro in lithography understands that a sheet so fixed between points must as a rule remain in the same proportionate size as regards length and breadth.

There are some other good systems besides the automatic point-system such as that known as "Viellemard's." In this arrangement the sheets must have been previously perforated in points and margin, and, so far as the point system goes, this is probably the most perfect, for independently of the two large points at the edge of the sheet, there are also two or three V shaped cuttings made on a specially prepared perforated table. Into these V shaped openings triangular pieces are made to fit, and the most complicated chromo work can be easily registered by their agency. At the same time, there is always the disadvantage caused by the *réperage*, which has no points, and the paper moves slightly, making it almost impossible to avoid some slight variations, more especially as a poor quality of paper may further retard progress.

### PHOTOTYPE OR COLLOTYPE MACHINERY.

This kind of photographic printing by means of heavy inks is increasing most rapidly in France, and is being much utilised for both artistic and industrial work. For this reason the majority of our machine makers have naturally endeavoured to provide facilities for rendering the invention as productive as possible.

I believe the firm of Alauzet was the first to construct the collotype hand press, and the machine on its present lines quickly followed. The other machine makers soon turned their attention to the same class of work, with the result that improvements and additions were made on every hand.

The point in which the greatest alterations have been made is in the system of impression, and which has been much modified. By means of a sloping cam two or three successive inkings can be arranged while the cylinder is stationary, permitting of increased facility in making-ready, and allowing the arrangement of perfect inking, which must always vary according to the temperature and differences occasioned by the degrees of fineness in the lines, or the preponderance or otherwise of heavy or light parts on the plate.



Another recent improvement in collotype machines is in the system of inking. All who have had any experience of this class of work will have noticed that with the grained roller the ink necessary for covering the plate is deposited in too great a quantity on the lighter parts, and the heavier parts become flat. The usual method of obviating this is to use a gelatine roller which has the property of equally distributing the ink, and while properly covering the strong parts, delicately inks the finer and lighter portions. This has been further improved upon, and the automatic damping rollers have been discarded, as it is found that the gelatine rollers retain the necessary degree of humidity requisite for the impression for a long time. The damping table once found in front of every machine has been removed, and the grained rollers charged with ink for a second inking of the collotype plate, have given way to the gelatine rollers which keep the inking at the commencement of the impression.

Are gelatine rollers indispensable for the perfect inking of a plate? is a question I have put to many printers, both specialists and amateurs, and the reply has almost invariably been in the affirmative, confirming the opinion I have formed myself after a large amount of experience. To obtain a good run, I could not favour the caoutchouc roller, although I have used it for years in lithography.

I base my preference for the gelatine rollers on this fact: the gelatine rollers are not usually made in closed moulds, and thus are almost immediately adapted for the work of inking a damped plate and remain moist, avoiding the danger of the roller becoming too adherent to the plate. For this is, to my mind, one of the principal causes of the annoyance which so frequently accompanies this kind of printing, and results in filling up the fine lines of the design.

On the other hand, I can heartily advise a trial of the double-inking method. With the machines possessing facilities for using six or seven carrier rollers—two caoutchouc rollers close to the cylinder, then two grained rollers, a third caoutchouc roller, and then one or two grained rollers—these, in combination, work with surprisingly good results. I have made many experiments with rollers to this end, and find that caoutchouc rollers are of greater utility than those of gelatine.

Particular care is taken to avoid any shock caused by the motion during impression. This is, of course, an absolute necessity, for the least jar causes a breakage of the delicate plate, and while there is always an alternative—that of making the engraving on copper, yet the expense is a great drawback.

As a technical writer, I have at various times written a good deal on the invention and application of collotype and the use of photography to lithographers, and I have mentioned that the inventor of photolithography was M. Poitevin, who has certainly the right to acknowledgment on this account, but he was not the propagator of the process, this honour belongs to Fox Talbot, who is now eighty-two years of age. Besides this Englishman, an old confrère, M. Zurcher, a pupil of Senefelder at his studio in Paris, and a thorough lover of his art, no sooner learnt

of the invention of photography than he endeavoured to discover some method of applying it to lithography.

It was while endeavouring to discover some method of reproducing designs on metal that Nicéphore Niépce invented photography, and which he ultimately found to be a handmaid of lithography.

I will not attempt to recount all the various phases and developments which our confrère underwent before he ultimately arrived at a satisfactory solution of the question. The struggles and trials, the cost of time and money he experienced, are the lot of most inventors. He worked with Niépce, Poitevin, etc., who, after taking and learning from the poor fellow all they desired, cast him off, depreciating his work, though they shortly after put it into practice with much success, making a great name as the inventors of photolithography, while the real inventor—the one deserving of recognition—was summarily thrust aside.

I must crave pardon for this digression from my ordinary matter, but I wished to render what was due to a confrère whom an excess of reserve has kept in the background too long.

REFERRING to the abuse of specimens submitted by assistants seeking places, the *British Journal of Photography* says that numerous complaints are rife of the detention by photographers advertising for assistants, of the specimens and testimonials submitted to them by applicants. The editor says that he should scarcely have been surprised at this if the matter had not been previously dealt with on several occasions, denouncing the dishonesty shown on the one hand, and the stupidity and carelessness on the other. Operators or assistants, when submitting specimens, are strongly advised to write their names and addresses on some prominent part of the photographs. This will prevent improper use of them by unscrupulous persons. Again, copies of testimonials only, and not the originals, should be sent. In neglecting these precautions assistants are largely to blame in not securing the return of their specimens and testimonials. The warning applies to other professions besides photography.

How does it happen that England, which is noted for its high-class water colours—a feature, indeed, of English art—should do so little in reproducing such works in chromo-litho, and work altogether on oil lines; while France, which is as strong in strong oils as we are in water colours, has for all her chromo printing work gone in for the water colour type of drawings, and so coloured work, produced in one printing, but on four or five cylinders, has become possible in letterpress work, while it is impossible for the heavier oil-type to be produced by the same process in this country?—*B. & C. P. & S.*

It is not generally known that the great musician Von Weber claimed against Senefelder the honour of lithography. Weber sought to use stone to obtain engravings of music in relief, which he printed like other type on a typographic press. The attempt did not succeed. It was then that Senefelder took up the idea, but to make a picture or image instead of an engraving.

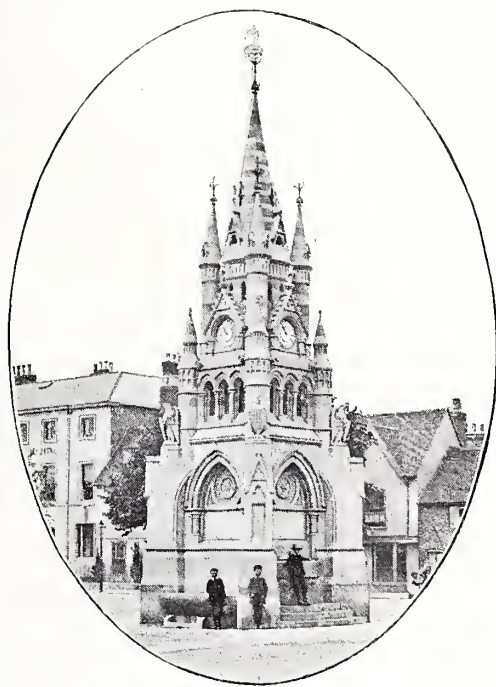
## Book Notes.



THE 1893 edition of "The Amateur Photographer's Annual" (Hazell, Watson & Viney, Ltd., 1 Creed-lane, Ludgate-hill, E.C.) is decidedly the *chef d'œuvre* of this popular annual. The whole of the contents are of a special character, and in their treatment of important questions, no less than the descriptions of best work by the most competent writers, photographers of all stages of development cannot but find a very large amount of useful and highly interesting matter. Amongst the articles calling for separate mention, the editor's clever and masterly description of the carbon process will prove very acceptable at the present time. "Practical work" and "Precept and Example" should be thoroughly assimilated by artists, being just the sort of tuition-criticism capable of bearing the best results. These are well illustrated both by pen and pencil. A valuable paper discourses "On Protecting Inventions," both at home and abroad, and inventors would do well to note the hints and particulars supplied. The "Holiday Guide" section was amongst the best features of last year's issue, and this year has been extended to form a complete photographic gazetteer to the United Kingdom. The information as to dark rooms, plates obtainable, various facilities and general information, is supplemented by valuable hints as to where to find interesting subjects for the camera. The number and quality of the illustrations ensures the annual being carefully kept for reference, for probably no other photographic issue has excelled these in point of beauty and utility. There are a large number of "process" illustrations spread throughout the pages, and these are supplemented by a splendid carbon print—a little gem—and no less than thirteen charming collotypes. We have pleasure in recommending the annual to the notice of our readers, the price (2/-, scarlet cloth) being much below the real value of the book.

"SHAKESPEARE'S LAND," by C. J. Ribton-Turner (Frank Glover, "Courier" office, Leamington Spa; 7/6), is the latest descriptive account of Stratford-on-Avon and the surrounding districts. No wonder artists find so many attractions in leafy Warwickshire. The county itself is full of charming woodland views, and pretty meadow and streamlet scenes, besides a wide range of noble halls, some of great age, and many of artistic value in point of picturesque beauty.

These scenes have been sketched on innumerable occasions, but the fascination obtained over the artist's mind is extended to that of the everyday individual who does not sketch, when it is remembered that the district is the home of Shakespeare, and that the Immortal Bard's wonderful description of bird and flower, of nature in her many moods, and of much that is attractive and beautiful, must have been obtained from association with this district. It is not surprising, then, that many books have been issued with the intention of assisting the stranger to make the most of his visit, and this work, just published, may



G. W. CHILD MEMORIAL, STRATFORD-ON-AVON.

FROM "SHAKESPEARE'S LAND."

be accepted as a capital guide and friend for this purpose. It is well written, most complete in its information, illustrations, maps and plans are freely used, and the whole is well got up into a convenient size for use. In its company a ramble may be made much more interesting than otherwise, and everyone interested in the district, more especially intending visitors, should obtain copies for themselves. The accompanying views are inserted by kind permission of the publisher, and are from photographs taken by Messrs. Bullock Bros. and Messrs. Smartt and Son, of Leamington.



"PHOTOGRAPHY ANNUAL" for 1893 (Iliffe & Son, St. Bride-street, Ludgate-circus, E.C.; 3/6) is destined to become as scarce as its predecessors are reported to have soon become, and good as the first volume undoubtedly was, this issue eclipses it in point of matter and illustrations. The arrangement of the work into sections has been continued, and is most handy for reference. In section 1, the valuable tables of reference have been revised, and include such useful matters as thermometer readings, tables for enlarging and reducing, the metric tables, a list of chemicals used by photographers, poisons and antidotes, and tables of symbols. Section 2 contains the third hundred hints continued under the title of "Hints for Tyros," the value of which cannot be over-estimated to the beginner in the various departments of work. In section 3, the progress of photographic chemistry during 1892, and the progress of astronomical photography are treated of, the latter being illustrated with some interesting illustrations from photographs of comets. Selected articles on practical subjects by practical men occupy section 4, every part of which is well worth the best attention. Section 5 forms a guide to the purchase of photographic materials and apparatus, the remaining sections treating of the latest novelties before the trade, information about the photographic societies, and various matters interesting to the photographic worker. As before, a special feature is made of illustrating the volume in such a manner as to show by comparison of results the best work in photographic reproduction processes, from the work of English, Continental and American firms. Besides this, the selection is made of pictures which have secured prizes or commendation in "Photography" competitions. Thus it is needless to say that the pictures with which the book abounds are in the highest taste, and beautifully made and printed, making the book a perfect art gallery. We have heard some good opinions of this annual, and our own opinion is that every photographer should obtain a copy of it.

MESSRS. BLADES, EAST & BLADES have in hand a commission worthy of their reputation and resources. By permission of the Library Committee of the Corporation of London, they are reproducing the magnificent collection of pictures presented by Sir John Gilbert, R.A., to the Corporation of London, and now on exhibition at the Guildhall Art Gallery. The reproduction will be by collotype, and will consist of sixteen pictures, which are amongst the finest examples of this celebrated artist's work. The volume will be printed on superfine paper, royal-4to size, and handsomely bound. It is to be issued to subscribers at £1 1s., this price being raised to £2 2s. after completion of the subscription list.

"SCRIVELSEY, THE HOME OF THE CHAMPIONS, with some account of the Marmion and Dymock Families," by the Rev. Samuel Lodge, M.A., (W. K. Morton, Horncastle, 10s. 6d.). The task of collecting scattered fragments of history is always a difficult one, especially when to this is added the research necessary for the proper verification and authenticity desirable for

such a work. In this book, the result of the author's endeavours in this direction has been to bring together in a most readable form the history of that old institution, the "Championship," with the historical associations clinging round "Broad Scrivelsby." So old is this office and its barony, that it is shewn to have been founded by William the Conqueror, by whom the Marmion family received office and estate. The varying fortunes of the family, the ceremonies and perquisites attendant on the Championship, and the no less interesting records of a famous section of the historic county, are well described by competent hands. Some capital illustrations make the history additionally attractive. The publisher is to be congratulated on his well got-up production. With its good paper, clear type, and neat cover with bevelled edges, the book forms a handsome addition to any library.

"TRAITE DE PHOTOLITHOGRAPHIE," by Léon Vidal (Gauthier-Villars et Fils, Quai des Grands-Augustins, 55, Paris; 6 fr. 50 cent.). This work from the hands of the well-known specialist is especially welcome at the present time, when reliable information on the applications of photography to the mechanical arts is increasingly called for. Not only does the "Traité Pratique" deal with photo-lithography—of which it is a masterly exposition, but the kindred processes of collotype, autography and photo-zincography, and the principal methods of engraving on wood or metal are also carefully treated of. In the discussion of each method, the full process of working is detailed, and this includes both those adopted by recognised authorities, each with the author's practical notes and criticisms, as well as descriptions of other general and special methods in use. A number of diagrams, illustrations, and specimens materially add to the interest and value of the book. As an exhaustive research into photo-lithography, autography, collotype, and zincography, and as a reliable compendium of hints on methods and appliances, the book is worthy of the most careful attention. The second and third of the series, "Photogravure en Relief," and "Traité de Photochromie," as promised by M. Vidal, will be eagerly looked for.



*The Studio* is a new publication commenced in April last, and issuing from the establishment of Messrs. Lawrence & Bullen, Henrietta-street, Covent Garden. It purports to be an illustrated magazine of fine and applied art, and as such, a good deal is expected from it. The first four monthly numbers scarcely justify passing any opinion as to whether the journal has fulfilled its purpose. When it has been running awhile the publishers may have found their correct line, and the requirements of the readers they apparently cater for. One thing can be said so far as lithography is concerned, that it is really the smallest section of artists to whom they appeal. Their efforts have been to meet the textile, architectural, and ornamental designer, rather than the printing artist. But to the latter a number of useful articles and illustrations have already been presented.






Printed on the STAR CHROMO ENAMEL PAPER, Manufactured by  
 MESS<sup>RS</sup> HENRY & LEIGH SLATER, Limited, Bollington, near Manchester, CHESHIRE.  
 Warehouse: Dantzic Street, Manchester.



Figure studies have been well illustrated from clay models by Sir F. Leighton, from photographs from life, both clothed and nude; animal studies have been touched upon; ornament and figure have been slightly dealt with by Mr. W. Crane; but, by far the most useful matter has been actual drawing on grained boards, and other ways, for printing purposes, with a number of illustrations of work from blocks executed in various ways, by the bitumen process, swelled gelatine process, and albumen process. It is a remarkable characteristic of present day journalism which appeals to artists or printers, that first of all, the illustrations are solely photo-mechanical productions, and much of the reading matter is devoted to this new sister method of assisting so largely in excellent and exact illustration. From these cursory remarks it may be inferred that *The Studio* has a respectable future if it can keep upon the educational side rather than get into the prosy reviewing of books and the gossiping side of art life.

THE summer number of *The Dundee Weekly News*, which retails twenty pages of bright light reading matter for one penny, also contains a series of amusing illustrations on which our artist friends have been displaying themselves. The journal is evidently widely popular.

### Reducing Plate Engravings on Stone.

HAT unusual care is necessary in lithographic reduction and reproduction of steel or copper plate engravings is conceded by every practical worker at this special branch of the business. A technical brochure, which was published during last year at Lyons, France, says that such reducing is most difficult to do in a proper manner, not because of the trouble in mounting, but on account of essential nicety in printing the proof. In order that a perfect result may be obtained, the operator must have entire control of his auxiliaries, know exactly the quality and consistency of his paste, and moreover have a keen, strong, and unerring vision. The following details should be strictly observed:—

Proceed the same in sizing as for engraving on stone, taking the precaution to ink the plate as evenly yet as lightly as when proofs are required on either India or China paper. To prevent any of the numerous accidents liable to occur to the inexperienced, if the plate should escape the pressure, it is suggested that the workman should first take a sheet of pasteboard quite as thick as his plate, then cut in the centre of it a place large enough to fit the metal in snugly and accurately. He must afterwards take a sheet of ivory or porcelain finished cardboard, cut it in the same way as before, and cover the pasteboard with it, as otherwise wrinkling of the protecting board might spoil the rubber. Sufficient pressure should then be applied to get a clean proof. It must not be forgotten when this proof is being taken that a double sheet of damp, unsized paper ought to be laid over the rubber to facilitate the printing.

As the inking of the metallic plate, whether it be copper or steel, is very light, vigilance must again be exercised to make sure of the clearness of the proof before a transfer to the stone is begun. Mount slightly in the same manner as for a proof on the stone, then, if possible, keep it a few hours under the gum; finally complete the inking, and acidulate as for any other reduction. Practice and long experience are necessary as well as muscular strength and acute judgment in making transfers, if it be desired that no impasting shall be produced in printing—an impasting which results from the fine parts of the plate engraving, the lines of which are very close to each other. Frequently the close lines form black spots extremely difficult to avoid making.

Thoroughly wash the stone, scrape the roller through to obliterate every trace of old ink; then roll it for some time over the slab until it assumes a greyish tint. Remove the gum from the reduction, which must be judiciously “raised” and then carefully inked with the roller. Now is the supreme moment, and muscle is requisite, for the reduction must be inked with the roller without ink. It is therefore indispensable to close the fists strongly and to lean heavily upon the reduction in order to ink the composition enough to obtain a transfer proof. Again, care must be scrupulously exercised in the selection of a proper recipient of this pressure. The print should be on a sheet of China paper evenly moistened (not sponge soaked) and with plenty of packing. A proof thus obtained should, if artistically taken, have an ash grey tint, very uniform, and without any spots or line-breaking.

REPORTS and specimens received show that an almost incalculable amount of process engraving is being done in connection with illustrations of the World's Fair. The Chicago engraving companies are entitled to take credit to themselves for the greater proportion of the work, the splendid effect and finish of the plates being remarkable.

### Results of Technological Examinations in Lithography, 1893.

#### LIVERPOOL CLASS.

Bowen, J. . . . .	1 O	McClay, A. . . . .	2 O
Duncan, J. . . . .	1 O	Gowan, J. . . . .	2 O
Gommersall, H. . . . .	1 O	Christopher, R. J. . . . .	2 O
Sherridan, F. . . . .	2 O		

Twelve sat for examination.

2nd Prize (£1) and Cordwainers' Company's Bronze Medal.

#### LEICESTER CLASS.

Stevens, W. . . . .	1 H	Bott, W. E. . . . .	2 O
Cheshire, A. C. . . . .	2 H	Cooke, A. . . . .	2 O
Howard, W. . . . .	2 H	Goodman, T. . . . .	2 O
Pye, W. J. W. . . . .	2 H	Heggs, W. H. . . . .	2 O
Wallace, L. H. . . . .	2 H	Martin, J. C. . . . .	2 O
Watts, J. H. . . . .	2 H	Riddington, J. W. . . . .	2 O
Carr, R. W. . . . .	1 O	Allen, R. O. . . . .	2 O

#### DERBY CLASS.

Livingstone, T. H. . . . .	2 O	Graves, John H. . . . .	2 O
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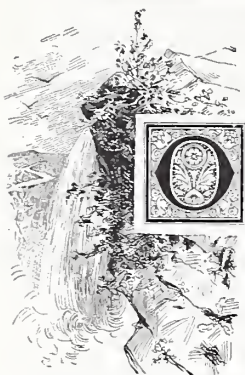
One sat in Honours and failed; three sat in Ordinary Grade.



## Trade Reports.

(From our Special Correspondents.)

### LIVERPOOL.



On Saturday, April 21st, the members of the litho technical class and a few friends visited the extensive works of Messrs. Furnival & Co. The party left the Central (Cheshire Lines) at one o'clock, arriving in Reddish shortly after two, being met at the station by Mr. Hale, the firm's representative, and Mr. W. T. Wilkinson, Manchester,

the latter gentleman photographing the company in front of the main entrance to the works, and subsequently supplying collotype prints of the group. Inside the works, from the plans and pattern shop to the finished machine, everything was interesting and instructive, the quantity of all kinds of machinery in course of construction being really amazing. One 65 x 45-in. litho machine created considerable interest on account of its gigantic proportions and smooth, steady running. After an hour and a half had been profitably spent in the works, the company assembled in the office. On their behalf, Mr. Honeyman thanked Mr. Hale for the very able manner in which he had explained the various operations, and the firm for their kindness in affording an opportunity for the furtherance of technical instruction. A few pleasant hours were spent in Manchester *en route*, the company arriving in Liverpool at 10-30.

TOWARDS the end of the session the Hull Patent Zinc Plate Co., Ltd., offered several prizes to be competed for by members of the litho technical class for the best results obtained from their own plates. Mr. Honeyman accepted the company's offer and agreed to act as judge. The following were the conditions and requirements:—

1. A first prize of £2 for the best transfer (to the Co.'s own plates) from any fine engraving and six impressions from same; the half of such afterwards erased and any other subject added to the erased part and six impressions taken, the quality of the latter impressions to decide the prize.

2. A second prize of £1 for the best transfer from grained stone (to the Company's plates), six impressions to be taken each of four different coloured inks, choice of colours left to competitors. In case of equality a re-transfer and six impressions in black to decide.

3. A third prize of 10/- for the best transfer of solid and fine—the solid from stone, the fine from copper plate (to their own plates), and six impressions from same in bronze blue ink. In case of equality an addition of solid transparency to any blank part of same plate to decide.

Successful competitors to forward in writing their method of treatment to the Hull company, with proofs.

The Company supplied all students with plates, etching solutions, and book of instructions, but competitors were not bound to follow the latter.

Owing to the practical nature of the competition, a week was allowed to complete the proofs, and the competitors were supplied simultaneously with transfers for all three competitions. Some excellent results were obtained in No. 1 (first prize) when it was clearly demonstrated that the Hull plates were exceedingly well adapted for transfers from fine engravings, the alterations were accomplished in excellent style and could not have been surpassed from stone. For No. 2 a fine portrait chalk drawing was the subject. The winner of this competition produced really first-class results, at the same time it was quite evident that more difficulty was experienced here than in No. 1. This fact may be useful in arranging the prize list for any similar competition in the future. No. 3 (solid and fine) did not require the same amount of technical skill as Nos. 1 and 2, but was useful in demonstrating the utility of the Hull plates for commercial work. The proofs here were all good, very little forming the distinguishing line to prevent an equality, and altogether the tasks were very instructive and afforded the students an opportunity for displaying practically their skill in manipulating the Hull plates. Members of the trade outside the class took a lively interest in the proceedings.

The following are the names of the winners in this competition:—

- |                 |         |                         |
|-----------------|---------|-------------------------|
| 1st prize of £2 | - - - - | John Duncan.            |
| 2nd „           | £1      | - - - Alexander McClay. |
| 3rd „           | 10/-    | - Hugh Henry McDonald.  |

The competitions raise the question of practical examinations in lithography, like many other trades, by the London City Guilds. No doubt there are certain difficulties in the way which would require to be overcome, but probably the examiner will see his way to make the alteration soon. The Ordinary Grade examinations are purely theoretical and seldom very difficult, rendering it quite possible for a man or lad who may be a good penman to obtain a certificate, while practically he may not be worthy of it. On the other hand, students may fail solely through not being smart enough with the pen, but had they an opportunity for displaying their ability in some practical form, would doubtless prove their superiority. This would encourage deserving men who sometimes fail.

On Saturday, June 24th, the employes in the litho department of Messrs. Blake & Mackenzie, horticultural and fine art printers, held their annual picnic. Barton, near Ormskirk, was selected for the occasion, the party leaving the works at noon in well-appointed waggonettes. A halt was made at the Sefton Arms, Aintree, where dinner was partaken of and a liberal supply of fruit, cigars, &c., distributed. The party then continued their most enjoyable drive through Magull Lydiat and on to Barton, where they received a hearty welcome at the "Blue Bell." Dancing and various games occupied the afternoon. An excellent tea was served at five o'clock, after which songs, toasts, and votes of thanks brought a pleasant visit to a close. The party reached Liverpool at 10-45 thoroughly satisfied with their enjoyable outing. Messrs. Whale and Edwards, the old-time committee, scored again.

THE result of the technical examination has, so far as this district is concerned, fallen short of general expectation, not, we are satisfied, through any neglect or half-heartedness on the part of the instructor, but on the part of some of the members of the class. We think they have been relying too much upon their practical knowledge of the rule of thumb order, instead of as students of technology, searching the books and journals on the subject.

TRADE in Liverpool is in a fair and, we hope, a flourishing condition for the future. Several firms are making strong efforts to be abreast of the times, improving their plants by laying down new machinery and pushing for a fair share of the better class of work. Much is expected from some of these firms, and we feel sure success will be certain.

#### EDINBURGH.

TRADE is still very quiet, about six members of the Society being unemployed.

PICNICS AND SPORTS in connection with all the printing firms in the city have been taking place nearly every Saturday for the last two months. The weather has been very favourable, and all the favourite resorts in the district have been visited by the various establishments.

THE local branch of the Amalgamated Society of Lithographic Printers held a meeting in the Trades Hall, High-street, on the 13th June, for the purpose of increasing the membership of the branch. In the absence of the president (Mr. A. T. Taylor), the vice-president (Mr. J. Russell) occupied the chair, and after a few introductory remarks the meeting was addressed by Mr. J. Mallinson (secretary to the Cordwainers' Society, member of the Trades Council, and local correspondent to the Board of Trade), followed by Mr. Geo. D. Kelly (gen. sec. A.S.L.P., Manchester), who stated that the entrance fee had been reduced to one-half for a limited period, and the age limit extended to forty-five years, as an inducement to non-society men becoming members. A vote of thanks to the speakers terminated the meeting.

Mr. J. Burns (the late secretary) has been appointed assistant-inspector of factories for Glasgow district, and commenced his new duties on June 1st.

#### LEICESTER.

ON Saturday, July 22nd, about twenty-four members of the Amalgamated Society of Lithographic Printers, Leicester-branch, held their annual picnic at Woodhouse Eaves. A start was made from the club-house, the "Duke of Wellington," at two o'clock, and after a pleasant drive Woodhouse was reached shortly before four o'clock, the party being here increased by some members who had ridden on their machines from Leicester. After doing justice to a good tea, the whole of the party were photographed; then a stroll was indulged in, and after a capital smoking concert, songs being contributed by Messrs. Webb, Lewin, Langton, Chapman, Drinkwater, Buckingham, and McGregor, a start was made for Leicester, which was reached just after ten. The delightful weather contributed largely to a most enjoyable outing.

#### DERBY.

TRADE is reported as only moderate in all branches.

THE lithographic printers of Derby, with wives and friends, had their annual trip on Saturday, July 8th, the place selected being Lathkill Dale. The party journeyed to Rowsley by the 1-50 p.m. special from Derby, and on arriving there vehicles were provided to take them to Alport. After a short stay for refreshments the footpath was followed through the lovely dale of Lathkill to Over Haddon, assembling at the Lathkill View Hotel, where ample justice was done to an excellent tea provided by Miss Wildgoose. After tea the party lingered in the vicinity of the hotel enjoying the grandeur of the surrounding scenery. Shortly after seven o'clock another start was made, and after a very pleasant walk of about two miles through the fields, Bakewell was reached, where, after a short stay, the return train was met at 8-50 p.m., arriving at Derby at 10-10 p.m. The weather was all that could be desired, and a most enjoyable afternoon was spent.

MESSRS. J. PEACH & CO., Brook-street Printing Works, have voluntarily reduced their working hours from 54 to 52½ hours per week.

THE local *Labour Journal* gives an interesting chat with Mr. Allan on his eight-hour experiment, the results being evidently worthy the attention of both employers and trade societies.

#### HYDE.

LITHO. ESTABLISHMENT STRUCK BY LIGHTNING.—On Monday afternoon and evening, July 3rd, a most terrific thunderstorm raged over the manufacturing town of Hyde and neighbourhood, and the crash which brought the disaster will not readily be forgotten by the residents. The tall chimney of Messrs. Cartwright & Rattray's (Ltd.) new building, only recently completed and in going order, was struck by the lightning. The chimney was not protected by a conductor, and the works lie low by the brook. On one side there is a sparsely wooded hill, crowned by the tall mills of Messrs. T. Ashton & Sons, and the church in Flowery Field: yet these, though perched on the hill, escaped, and the printing works in the hollow did not. Why this was so is difficult to explain. The chimney, without conductor, stands high, but is fairly surrounded by chimneys with conductors, which it would have been expected would have protected almost the whole area. The only feasible suggestion is that lightning very frequently follows, or strikes, in a draught: such draught being the valley of the brook. The chimney, however, was not thrown down. The lightning tore out the brickwork of the outer course only, from near to the top down some thirty feet, in the shape of a long thin fish, and finished its havoc by cracking the chimney to the base. Whether it will require rebuilding is yet a matter to be determined. Since that day the whole Lancashire district, from Preston, down by Chorley, Rochdale, Oldham, and Manchester, have been visited by most severe storms on successive days, committing havoc wherever they went.



## BIRKENHEAD.

ONE of the most destructive fires which have occurred in Birkenhead for some years broke out soon after six o'clock, on the morning of July 17th, in the fine block of buildings in Hamilton-street, occupied by the North and South Wales Branch Bank, the Prudential Insurance Company, and Messrs. E. Griffith and Sons' printing and stationery works. When first observed, the fire was in the latter building, and alarm being given at the fire station close by the brigade were at work in a few moments. Fanned by a high wind, the flames had made rapid progress, and Messrs. Griffith's works were blazing furiously. The wind blew the water back in spray as it was forced from the hydrants towards the burning building, and thus the flames continued to make headway, and soon extended to the adjoining premises occupied by the Prudential Insurance Company and the bank. The firemen made strenuous exertions to subdue the flames, and though Griffith's premises were gutted they succeeded in extinguishing the fire before much damage had been done to the other premises.

## Correspondence.

To the Editor of THE BRITISH LITHOGRAPHER.

DEAR SIR,—Seeing the notice in the B.L. for June-July *re* the embossed stone and packed cylinder case, I cannot let the matter pass without informing you that the process is a very old one, and cannot attach any patent to it as regards Mr. J. E. Bird. I can show you pattern books of terra cotta, issued by Wilcocks, of Burmantofts, Leeds, lithographed by myself and embossed by etched stone and packed cylinder, which have been out in the trade for over sixteen years. I believe I was the first to do it in this district at all events, and I had not seen any work done previous to my doing it.

I may mention that I have abandoned the stone twelve months since for another process, which is cheaper, more expeditious, and gives a sharper result.

Trusting you will pardon me for intruding in this matter.

I remain, yours truly,

WALTER MASSER,

(Manager and Director, Massers, Ltd.)

Leeds, July 7th, 1893.

To the Editor of THE BRITISH LITHOGRAPHER.

DEAR SIR,—I have just read in the B.L. about the case of embossing from litho stones. I must say I was surprised to see it, for I saw the late firm of Messrs. Shaw & McArthur, of Nottingham, emboss chromos with the litho stone over twenty years ago, and I have some of their chromos on the walls of my house. I often went into their works and saw the stone and the chromos run through on it, so I cannot see the right of anyone to claim it as a patent.

Yours truly, F. R. PICKERILL,

(T. Pickerill & Sons).

Nottingham, July 11th, 1893.

## Specimens.

[Will our friends kindly remember to send their specimens either TIGHTLY ROLLED or FLAT BETWEEN BOARDS; the cost is but a trifle more, and for review they gain in being presented as they come from the machine. If sent unprotected, specimens are usually so crushed and disfigured as to be utterly unfit for criticism or preservation.]



THE PROGRAMME got out on the occasion of the annual outing of the employees of Messrs. Page Bros. & Co., which came off on Saturday, July 1st, is a capital piece of work—a double folder, in one colour, quietly and tastefully designed, and with appropriate frontispiece. Yarmouth was chosen as the place of festivity, and the saloon steamer *City of Norwich* the selected medium for getting there. A start was made soon after seven, the fresh morning air developing some marvellous appetites by the time breakfast was served. A halt of an hour was made at Coldham Hall, where the party was hospitably received by Host Fisher, after which the skipper sang "All Aboard," and the good ship made for Bloaterville, where dinner was discussed in the saloon with considerable zest. After enjoying themselves to the full in the delights which just now jostle each other on the grand beach which is Yarmouth's pride, the party re-embarked for home at half-past four, tea being put upon the tables an hour and a half later. The convivial proceedings were presided over by Mr. J. Amies, who was faced by Mr. J. H. Langham, and a lengthy programme of toast and song was gone through. The toasts ended, the delights of the day overcame the charms of harmony, and a pleasant hour was spent at Bramerton, the party reaching Norwich at a late hour after a real day's enjoyment.

MESSRS. TAYLOR BROTHERS, Leeds, show their usual good taste and thorough workmanship in the seasonable calendar sheet ( $22\frac{1}{2} \times 17\frac{1}{2}$  in.) representing "Our Future Sovereigns." The portraits of the Duke and Duchess of York are tastefully and pleasingly produced in oval frame on a toned groundwork, with appropriate sprays of wild flowers, including the popular May blossom. Short pars. at the foot give some information about the Royal pair, and spaces are left for insertion of name and address. The sheet has only to be seen to be appreciated.

A SPECIALLY tasteful and dainty line from Messrs. Millar & Lang—the "Royal" stationery—consists of small oblong note of rough surfaced cream tinted paper, scalloped and gilt edged, with envelopes of novel shape to match. These are made up in card boxes, with embossed cover, including silhouette design of the royal pair, in 12/12, retailing at 1/-.

The Engraver and Printer for May last contains even more than its usual quota of good things in the shape of ideas for artists, utilising various processes. Our Boston contemporary is always welcome.





DE MONTFORT PRESS LITHO.

LEICESTER & LONDON.

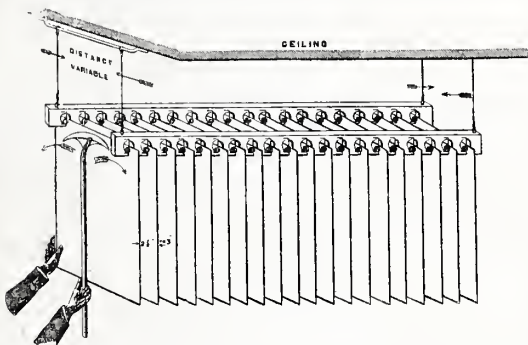
PRINTED ON GROSVENOR, CHATER & CO'S Celebrated Fine Art  
"Acme" Printing Paper.



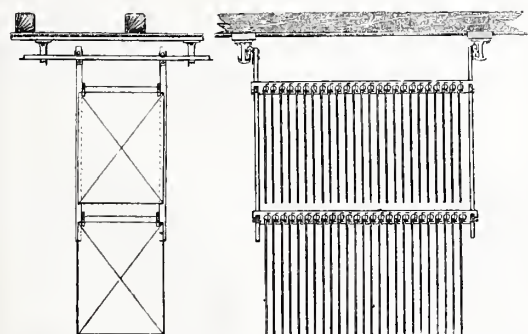
## Trade Notes.

**S**INCE last issue, experiments have been made with the patent "Tenax" Suspending Clips mentioned in that number as introduced by Mr. Edward Schery, 134 Deansgate, Manchester.

As may be inferred from the accompanying illustrations, the clips are very simple in construction and, if possible, simpler still in action. The introduction of sheets against the grippers temporarily forces back a china ball, which immediately afterwards slips automatically into its place and securely and firmly holds



the sheets suspended. The mere action of lifting the balls, either with the fingers or by the aid of a stick, is sufficient to release the sheets immediately. It is noteworthy that no creasing or marking of the sheets takes place, though the grip is sufficiently firm to hold a comparatively large number of sheets together, and as the balls automatically allow of any contraction the sheets may undergo in the process of drying, any



wrinkling of the sheets is obviated. The bars are strong and are capable of carrying a large amount of paper in process of drying. Though usually supplied in bars of 6-ft. 2-in. lengths, of 25 clips, they can be made to any size, according to the accommodation of drying rooms. The advantages of the "Tenax" Suspending Clips include a saving of labour as compared with that necessitated in rooms fitted with iron or spring clips, strings, and cowhair ropes. The bars may be arranged singly so as to hang the sheets cornerwise, or in parallel rows, so that each sheet or set of sheets may be

held by two clips. The bars may be suspended by wires or by iron hangers and are thus easily adapted to any position. The "Tenax" Clips are designed for practical use, and as such are well worthy the attention of lithographers.

In their card calendars for 1894, Messrs. Taylor Brothers, Leeds, present some high-class colouring together with free and original design and attractive subjects. Of the specimens to hand, the half-dozen 12 x 9-in. are good specimens of their class, the bright colouring, artistic arrangements, and pleasing effects combining to produce a very attractive series. The seascape No. 89 is quite "Turnerian" in style, the fresh breeze filling the sails of the outward-bound vessels and curling and whitening the tops of the waves, with the generally breezy surroundings, are well portrayed in a bright stirring picture, sure to prove attractive wherever it is seen. A rich sunset scene set in florid floral spray makes No. 90 pleasing in tone, though tending towards loudness of colour. No. 91 is arranged with good effect, the central handsome vignette with rich spray of blossom on tinted ground overlaps a pretty coast view, the whole forming a charming picture, well adapted to attract as a wall calendar. A spray of azalea nicely worked and pleasingly coloured makes No. 92 appropriate for almost any position, the average observer usually admiring a tasteful display of flowers. The rich figure of a kingfisher perched on a reed forms the centre-piece to No. 93, the rich border being quite a study in blue and chocolate and gold. No. 94 has a similar border, the centre being left for insertion of matter. Date slips attached to the cards remind one that the pictures are intended for use, blank spaces also awaiting name and address. Another calendar, containing dates for the year, a large amount of useful postal information, and spaces for memoranda, though guiltless of any attempt at ornament, is of much practical value, and therefore quite as welcome as its more gaily attired companions. Artists and printers may obtain many ideas of value from these cards, and buyers should not fail to obtain samples.

### FOUGEADOIRE'S ENLARGING & REDUCING MACHINE.

—This well-known apparatus, which is the invention of a French engineer, M. Fougadoire, has been enquired for lately by one or two correspondents. Messrs. B. Winstone & Sons, of 100 Shoe-lane, E.C., are the sole British agents. We understand that the machine is much appreciated amongst printers and lithographers of this country, and that a good number of them are in use in the provinces. Amongst London users we may mention the following firms: Sir Joseph Causton & Sons, Southwark-street, S.E.; Messrs. Drake, Driver & Leaver, Rosebery-avenue, E.C.; Thomas Poulter & Sons, Ltd., 6 Arthur-street, West, E.C.; Tucker, Johnson & Co., 98 Southwark-street, S.E.

*Photographic Answers* has come to life again after a year or two of oblivion. It is sure to be greeted with considerable pleasure for the lovely collotype plates usually published with it.



MESSRS. RAPHAEL TUCK & SONS issue a catalogue descriptive of their wide series of books and booklets, Christmas and other cards, calendars, dance programmes, and many kinds of fancy stationery. When it is seen that the catalogue totals to the large number of 120 pp., exclusive of a neat cover, it suffices to

prove the extent of the patronage the popular company's art productions receive. The catalogue is copiously illustrated, the innumerable branches into which their publications are divided, and the no less numerous "special" lines, are each illustrated by reduced reproductions from their particular series. We show two of the blocks, one from the "Boudoir" series, and the other from the "Dainty" series.

From a careful examination of the contents, and with all due respect to their more than admirable predecessors, we should judge that the new productions in originality, variety, and good taste seem to stand out boldly from those of preceding years. It is impossible to make any selections for special notice: all are excellent. The special attention of amateurs and *literateurs* may be drawn to the literary and painting prize competition held in connection with the company's book, booklet, and calendar publications for '93-4, in which £1,000 in money prizes and £1,500 in art prizes, aggregating a total of upwards of 3,000 prizes of the combined value of £2,500, will be awarded to the successful competitors in the art competition.



MR. THOMAS IBBETSON, son of the late Mr. William Ibbetson, and a member of the firm of Messrs. Armitage & Ibbetson, lithographers, of Stott Hill-works, Bradford, died somewhat suddenly at his residence, 18 Claremont, on the 5th inst., at the age of thirty-six. The deceased was one of the three sons of the late Mr. William Ibbetson, Messrs. W. H., Thomas, and Joseph, who have carried on the business since the death of their father, about eighteen years ago.

MESSRS. S. CHARLESWORTH & Co. have appointed Messrs. Walker Bros., Central Engineering Works, Bouverie-street, E.C., as their London agents.

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